



BENCHMARKS

Benchmarks Online 1994

- [Volume 15 \(1994\) Index to Articles](#)
- [January/February 1994\(Volume 15 Number 1\)](#)
- [March/April 1994\(Volume 15 Number 2\)](#)
- [May/June 1994\(Volume 15 Number 3\)](#)
- [July/August 1994\(Volume 15 Number 4\)](#)
- [September/October 1994\(Volume 15 Number 5\)](#)
- [November/December 1994\(Volume 15 Number 6\)](#)

These pages are meant for use as an archive for the University of North Texas publication *Benchmarks*. Many of these files are old and contain information and links to sites that no longer function. This is because over time, many sites shutdown or change addresses, thus voiding all links to them. Please keep in mind that not all links will work as they should.

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address:

WWW@unt.edu

Index To *Benchmarks*, Volume 15 (1994)

Focus And General Information

January/February: MacBirthday Issue

- [Happy Birthday Macintosh](#)
- [Confessions of a Former Mac Hater](#)
- [Everybody's Doing It - Mac in a DOS World](#)
- [Newton's Envy](#)
- [Purchasing a Macintosh or Other Apple Product at UNT](#)
- [Macintosh Emulation on UNIX Workstations](#)
- [Internet Tools for the Macintosh](#)
- [The Network Connection - A Brave New Internet](#)
- [FBI Asking For Help in UNABOMB Case](#)
- [The Internet Index](#)
- [LIST of the Month - Kid.media@airwaves.chi.il.us](#)
- [Information Infrastructure Task Force Announces Computer Bulletin Board](#)
- [State of Texas Recognized for Service, BBS](#)
- [News From the CWIS/Gopher Hole - Change in Focus](#)
- [UNT-Health Science Center Announces New Gopher](#)
- [Updated Electronic Phone Books Available on UNT Gopher](#)
- [Dallas Museum of Arts Providing Information and Images on UNT Gopher](#)
- [Information Resources Council News: November 16, 1994; December 14, 1994](#)
- [Staff Activities](#)

MARCH/APRIL: Research

- [Using Computers for Research](#)
- [Using UNIX for Research](#)
- [The Importance of Regression-Discontinuity in Educational Research](#)
- [Using SPSS at UNT](#)
- [A Guide to SAS Availability](#)
- [SUGI is Coming](#)
- [Using Secondary Data Sources for Your Thesis and Dissertation](#)
- [Sending SPSS and SAS System Files Over the Internet](#)
- [The Network Connection - Finding Electronic Mailing Lists](#)
- [List of the Month - Blake-request@albion.com](#)
- [Going Somewhere? Read This First](#)
- [Window on Texas Government](#)
- [New Standard Form on the 2680A Laser Printers](#)
- [News From the Gopher Hole](#)
- [Information Resources Council News: January 18, 1994; January 25, 1994; February 15, 1994; March 8, 1994](#)
- [Staff Activities](#)
- [Micro-Tips](#)
- [Apathy Alert](#)
- [Statistical Software User's Group](#)
- [New Multimedia Magazine](#)
- [Funding Opportunity](#)

MAY/JUNE: Electronic Data Transfer

- [Everything You Wanted to Know About FTP, and More](#)
- [The\(Somewhat Less Than\) Definitive Guide to FTP](#)
- [Now That I Have It, What Do I Do With It](#)
- [Requesting Internet FTP Files Via E-Mail](#)
- [FTP and CMS](#)
- [TCP/IP Stats](#)
- [Using the KERMIT File Transfer Program on UNT Host Systems](#)
- [Sending SPSS and SAS System Files Over the Internet](#)
- [The Network Connection - Sending That Binary File](#)
- [List of the Month - RSI on majordomo@world.std.com](#)
- [Trojan Horse Not Just History](#)
- [Taking a Byte Out of RSI](#)
- [Popular FTP Sites Via Gopher](#)
- [News From the Gopher Hole - Changes in Other Gopher References](#)
- [UPC On-Line in Gopher](#)
- [GopherCON 94](#)
- [Clip Tip](#)

JULY/AUGUST: The Changing Internet

- [On the Road to the Information Superhighway](#)
- [What does the Future Hold for the Internet?](#)
- [The Ghost in the Modem](#)
- [Another Way to Cruise the Internet](#)
- [Best O' the Net](#)
- [Drop of BITNET Connection Likely](#)
- [The City of Denton, TWU, and UNT](#)
- [Hobbes' Internet Timeline](#)
- [The Network Connection - How Secure is Your Internet Mail?](#)
- [List of the Month - GRANTS-L on LISTSERV@GSUVM1.GS1.GSU.EDU](#)
- [FAQs Available Via E-Mail](#)
- [New Internet Book Available](#)
- [Anonymous FTP](#)
- [Some Welcome Changes Come to Local Dial-Up Lines](#)
- [News From the CWIS/Gopher Hole - Gopher Clients](#)
- [Information Resources Council News - May 17, 1994; June 14, 1994](#)

SEPTEMBER/OCTOBER: Back to School

- [Welcome Back](#)
- [What You Really Need to Know About Computing at UNT](#)
- [Student Computing Facilities at UNT](#)
- [General Access Computer Labs Policies](#)
- [Accessing UNT Host Computers From Home](#)
- [HST's to be Removed From Service](#)
- [The Adaptive Computer Lab](#)
- [Research and Statistical Support from ACS](#)
- [FAVORS](#)
- [World Wide Web Server Up](#)
- [News From the CWIS/Gopher Hole - The World Wide Web](#)
- [How to Add Information to the Web](#)

- [Graduate and Undergraduate Catalogs On-Line in Gopher](#)
- [VMS to be Phased Out](#)
- [A New Relationship Between Jove and Sol](#)
- [New E-Mail addressing Option for Jove and Sol Systems](#)
- [List of the Month - ORFEO on listproc@unicorn.acs.ttu.edu](#)
- [The Network Connection - Controlling Your Email](#)
- [Information Resources Council News - July 20, 1994](#)

NOVEMBER/DECEMBER: Community Computing

- [Electronic Greenbelts](#)
- [North Texas Free-Net](#)
- [Blacksburg, Virginia: A Model Electronic Community Network](#)
- [Gopher Free-Net Collection](#)
- [New City of Denton Information Available Electronically](#)
- [LINCT: Learning and Information Network for Community Telecomputing](#)
- [The Network Connection - Alternative Access to the Internet](#)
- [High Speed Modems](#)
- [Pizza on the Internet](#)
- [News From the CWIS/Gopher Hole - More Web Sites](#)
- [Additional World Wide Web Browsers](#)
- [EDUPAGE Items of Interest](#)
- [Information Resources Council News - September 22, 1994](#)
- [Announcing JobWeb](#)
- [Sending Files to Printing Services Via the UNT Campus Network](#)

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address:

WWW@unt.edu

Benchmarks

These are the articles published in the January/February 1994 issue.

These pages are meant for use as an archive for the University of North Texas publication *Benchmarks*. Many of these files are old and contain information and links to sites that no longer function. This is because, over time, many sites shutdown or change addresses thus voiding all links to them. Please keep in mind that all links may not work as they should.

MacBirthday

- [Happy Birthday Macintosh](#)
- [Confessions of a Mac Hater](#)
- [Everybody's Doing It](#)
- [Newton Envy](#)
- [Purchasing a Macintosh or Other Apple Product at UNT](#)
- [Macintosh Emulation on UNIX Workstations](#)
- [Internet Tools for the Macintosh](#)

General Information

- [The Network Connection](#)
- [FBI Asking For Help](#)
- [The Internet Index](#)
- [List of the Month](#)
- [Information Infrastructure Task Force Bulletin Board](#)
- [State of Texas Recognized](#)
- [News From the Gopher Hole](#)
- [UNT-Health Science Center Announces New Gopher](#)
- [Updated Electronic Phone Book Available on UNT Gopher](#)
- [DMA on UNT Gopher](#)
- [IRC News](#)
- [Staff Activities](#)

[1994 Index](#)



[First Article](#)

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

Benchmarks

These are the articles published in the July/August 1994 issue(Volume 15 Number 4).

These pages are meant for use as an archive for the University of North Texas publication *Benchmarks*. Many of these files are old and contain information and links to sites that no longer function. This is because, over time, many sites shutdown or change addresses thus voiding all links to them. Please keep in mind that all links may not work as they should.

The Changing Internet

- [On the Road to the Information Superhighway](#)
- [What does the Future Hold for the Internet?](#)
- [The Ghost in the Modem](#)
- [Another Way to Cruise the Internet](#)
- [Best O' the Net](#)
- [Drop of BITNET Connection Likely](#)
- [The City of Denton, TWU, and UNT](#)
- [Hobbes' Internet Timeline](#)
- [The Network Connection](#)
- [List of the Month](#)
- [FAQs Available Via E-Mail](#)
- [New Internet Book Available](#)
- [Anonymous FTP](#)

General Information

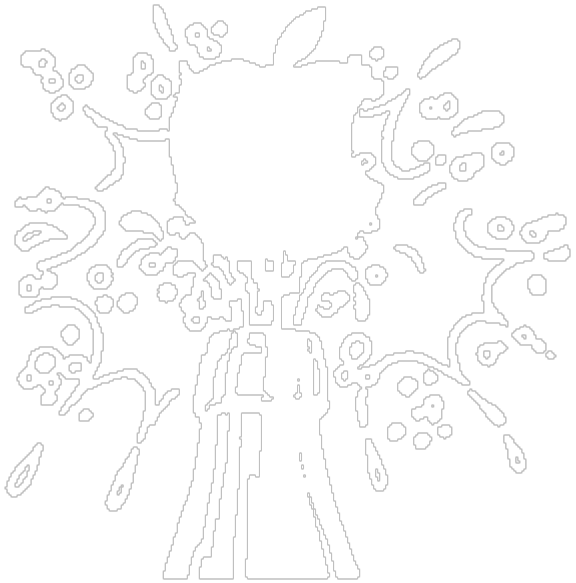
- [Some Welcome Changes Come to Local Dial-Up Lines](#)
- [News From the CWIS/Gopher Hole](#)
- [IRC News](#)

[1994 Table of Contents](#)



[First Article](#)

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu



Happy Birthday Macintosh

By Mark Thacker, CWIS Coordinator thacker@unt.edu

In this ever evolving world of technology, it's refreshing to look back on significant milestones to get a perspective of where we are and where we might be going. Today, I bring you a living example of a milestone - the Macintosh personal computer. January 1994 marks the Macintosh's 10th birthday, and its time to celebrate one of the unique developments in the computer industry.

So, I now give you a brief synopsis of the history of the Macintosh. It is both amusing and sobering. The most interesting part however, is that the next ten years promise to be just as the last.

The Early/Teething Years

In late 1983, people began seeing odd commercials on TV, commercials which promised a new kind of computer. One that promised (borrowing from the Orwell novel) 1984 won't be like *Nineteen Eighty-Four*." This computer was the [Apple](#) Macintosh. It was the first popular consumer market computer featuring a graphical user interface (GUI). Until then, there had been a few prototype systems, including the [Xerox PARC](#) Star and Apple's own Lisa. The Lisa was touted as a "rethinking of what a computer should be." However, it was very expensive for the time (the figure of \$10,000 comes to mind) and was very underpowered. The Lisa later resurfaced as the Mac XL for a brief time (it emulated a weak Mac 512K) then was quietly buried in a virtual silicon grave. So what about the Macintosh thing?

The Mac brought a new attitude toward using a computer, writing programs, and thinking about computing in general. The entire interface and use were based upon the use of a mouse with a single button. To enforce the use of a mouse, the first Mac keyboard did not have a function, arrow, or scrolling keys. Gosh, they were serious about this whole point-and-click thing!

The original Mac was also a very compact design, integrating the monitor, disk drive and CPU together into one compact case. The only external cables were the power, keyboard and mouse cables. The monitor was a 9" monochrome that featured an easy-to-read, black-on-white format for documents. The slow decay amber/green monitors commonly used on other machines looked a bit anemic compared to the crisp Macintosh monitor. Truly, as this was a computer like no other at the time. However, you can still see the original Mac's design evident in today's Macintosh ColorClassic II and the Performa series, [Compaq's](#) Presario, and [IBM's](#) [PS/1](#) computers.

The first Mac also introduced the idea of putting most of the operating system into ROM so that programmers could spend time and space writing their program, not writing the interface to their program. Programmers also had to rethink the way they wrote software for personal computers. Everything was event driven and the program responded to what the user did, not what particular prompt was on the screen. This method of programming is now considered the standard way of producing applications on microcomputers.

Sales of the Mac were slow at first because of two reasons:

- lack of software, and
- lack of software.

The price wasn't much of a factor as one might think. A new 128K Mac cost \$2,495, not bad when compared with the \$4,995 price tag of an [IBM PC-XT](#) or the \$5,469 of an [IBM PC AT](#) introduced one year later. The Mac had only a single, nonstandard (then) 3.5" disk drive onto which you had to run either your operating system or an application. Because programs took longer to write for the Mac than they did for character based machines (the IBM PC), software pickings were slim. Apple introduced Mac 512K to solve the problem of not enough memory in the original Mac, but that didn't really help. In fact, Apple had a one-year supply of the Mac 512K by 1986 and had sold their entire supply of 3.5" disks back to Sony because of lack of interest.

However, companies like [Lotus](#), [Microsoft](#) and Software Applications eventually brought out software for the Mac. With a whopping 400K of disk storage on the single drive, it was a wonder that programs like [Microsoft Word](#) or Excel could run at all. However, programmers hacked on the code, lived with the fact that the first Macs couldn't boot from the hard drive, even if you did hook it to the modem port as required. Programmers also had to write programs for the [Motorola](#) 68000 microprocessor differently than for the 8088 and 8086 in the IBM-PC systems.

As software support rose and people realized that this unusually designed machine could be useful as more than just a toy, the Mac community began to grow. The introduction of the Macintosh Plus addressed many problems of the earlier Macs. It included *one* whole megabyte of RAM. What an ocean of memory! It also finally introduced the Small Computer Systems Interface (SCSI) for connecting the hard drive. This interface is also considered a standard for microcomputers now

One other development was so basic that I almost forgot it. The Mac introduced the first consumer based What-You-See-Is-What-You-Get (WYSIWYG) interface for printing. Now, when you saw a 10 point *italic* Times Roman character on your screen, you could be assured that the printed version would be the same size and be on the same place on paper as it was on screen. Mac, [Windows](#) and [OS/2](#) users take this for granted now, but it's hard to remember that the average computer did not have WYSIWYG capabilities in 1984, and some still don't! Looking back on these early Macs, it is interesting that the Apple could be on both the leading and trailing edge of technology at the same time!

The Mac Grows Up

In 1987, Apple released the Mac SE and II to establish a new line of performance and minimum requirements for future Macintosh computers. The Mac II in particular was the first to use the 68020, open slots for future expansion and a choice of monitors. It was an absolute powerhouse for the Mac line. IBM-PC makers however were talking about and using the brand new Intel 80386 chip, which was more powerful in terms of processing power. The Mac began playing a game of cat and mouse with Intel based machines.

The expansion capabilities for the Mac came with quite a few goodies. The SE contained an expansion slot that surfaced later as "processor direct slots" (PDS) in other Macs. Note that Intel based machines are just now appearing with something called "local bus," which effectively is like the PDS on Macs. The NuBus expansion capability is carried on to this day, where you plug an expansion board into your machine without having to configure a single DIP switch, jumper, or worry about memory addresses. IBM does that with Microchannel, which shipped two to three years after NuBus appeared on the Mac II.

Color was also introduced with the Mac II. The Mac was capable of 256 colors out of a palette of 16.8 million. This was

much better than most machine of its time. As people began to use the Mac for photo work, the demand for greater capability in color display grew. Apple finally decided on a standard way of doing 32-bit color and began encoding it for the Macintosh ROMs shortly after that. Most modern Macs can display thousands or millions of colors by simply adding more video memory to the built-in display card.

More importantly than just revolutions in the capability of the CPU, the Apple [LaserWriter](#) was introduced in 1985. For the first time, the words "[PostScript](#) laser printer" and "scalable typeface" became part of the standard vocabulary of Macintosh users. Many people realized that they could now produce their own newsletters and not have to worry about jagged fonts or multiple point sizes of fonts installed in their computer. [Adobe](#) Systems owes much of their success to the success of the Apple LaserWriter and the shift in perception of what was possible for publishing with a desktop computer.

With the LaserWriter came one other item, AppleTalk networking. Macintosh users could use simple phone cable connectors (called PhoneNet) to wire their own network between Macs and LaserWriters. With the recent deregulation of the phone company, it became legal for consumers to wire their own house and phone based networks. So, Apple now had computers that were truly network aware right out of the box.

Sound capabilities were also included and expanded on slowly during this time. The Mac II featured the Apple Stereo Sound Chip. At 8 bit, 22KHz resolution, it wasn't exactly CD quality, but a heck of a lot better than the simple "beep" that was typical of other machines. It was long before people began sampling all sorts of sounds to play on the Mac. Even back in 1987, you would often hear Macintosh computers in campus labs laughing, screaming or quoting a line from your favorite movie.

The Modern Mac

One of the most important recent developments in the Macintosh was the introduction of [System 7](#), which shipped in 1991. This operating system finally made the Mac a true workstation-like computer and allowed Apple to take advantage of modular system extensions. Let's say that you wanted to add a new way of operating your computer, perhaps speaker-independent voice recognition. Don't rewrite the whole operating system, simply include an extension that makes new capabilities available to almost all existing applications. It also allows you to distribute the modifications to only those users who need it.

System 7 also included several other technologies that are just now beginning to make their rounds to other computer systems. Cooperative multitasking was not really new to the Mac, but was much refined, allowing a user to run multiple programs at once and cut & paste and even send certain messages among them. TrueType font technology allowed variable WYSIWYG fonts on non-PostScript printers (side note: Apple also licensed this technology to Microsoft for the use of Windows and Macintosh machines). Built-in file sharing means that an organization interested primarily in sharing files or E-mail need not purchase a file server. The system can share files with other Macintoshes very easily.

Apple has also adopted a flexible design philosophy that allows them to manufacture similar motherboards and cases that are upgradeable for future use. Previously, all Macs up to the IIfx has essentially been designed from scratch every time. The modular nature of the operating system also allows Apple to modify designs and just ship a new extension to make the hardware usable. In fact, in 1993, Apple shipped out seven different machines all based upon the 68040 CPU alone! This doesn't even include the other models of Macintosh.

Systems are also faster now. The standard processor in the Macintosh line is quickly becoming the 68040, a chip comparable to Intel's 486 series. The original Mac ran a 68000 CPU at 8 MHz; the fastest production Mac now runs a 68040 at 40 MHz. With all of this extra speed comes extra capabilities such as color processing, digital video, and better sound capabilities. The built-in networking capability of the Mac is now high-speed Ethernet rather than slower LocalTalk.

Speaking of new capabilities, the Mac that I am writing this on, a Macintosh [Quadra 660AV](#), has the following built-in: speaker-independent (no training) voice recognition, digital audio (16 bit, 44.8 KHz - better than CD quality) input and output, S-video and regular NTSC video input and output (dump your presentation directly to video tape on the Mac),

Ethernet networking, Cd-ROM with playthrough to speakers without any CPU time used, high density 1.44MB disk drive, file sharing, 32,000 color display capability, 8 MB of RAM (expandable to 68 MB), 230MB hard drive, an AT&T 32-bit Digital Signal Processor, capability to act as a telephone/answering machine/fax modem, and 25MHZ 68040 processor. (For additional information on this computer, see the article on page 6 of this issue of *Benchmarks*.)

Compatibility with DOS based machines is also quite common through file translation software and through DOS emulators. This article was written using WordPerfect for Macintosh which can save files in WordPerfect 5.1 DOS format, for example. For those wanting to run DOS software on their Mac, you can either purchase a coprocessor board that fits into you Mac and acts as a DOS machine, or you can run emulation software (SoftPC from Insignia Solutions) that allows your Mac to run DOS/MS-Windows software in a window on your Macintosh. (For additional information, see the article on [page 10 of this issue of *Benchmarks*](#).)

The New Genesis of the Mac

Where is the Mac headed? In 1991 Apple asked this question and came up with a unique answer: PowerPC. Apple signed a deal with IBM and Motorola to manufacture and market a new CPU designed from the IBM RS/6000 chips to be known as PowerPc. This new chip is totally different from the modern Motorola 680x0 chip; it uses a different intruction set or language; it is RISC based; it runs at a different motherboard; and the Macintosh operating system must be translated to work on it.

Essentially, Apple and IBM have agreed that their future lies the the PowerPC processor. It has the advantaged that it is a brand new chip that is more powerful than Intel's Pentium (whose technology is really at the end of it's lifetime). There are already two additional models of the PowerPc chip planned (the first is the 601, followed by the 604, and the 610). A variety of major vendors support the chip, including Apple, IBM, Sun, Cray Supercomputers, WordPerfect, Microsoft and others.

Beginning sometime in April, Apple will ship its first PowerPC-based Macintoshes. Eventually, PowerPC will allow you to run Macintosh, UNIX, [OS/2](#), [MS-DOS](#) and [MS-Windows NT](#) all on the same machine (in some cases, at the same time in multiple windows). Apple will ship a version of System 7 for use with the PowerPC that will allow modern programmers to run unchanged on the new systems. The PowerPC runs so quickly it will actually emulate a Motorola 680LC40 in software!

The future of the Mac is bright indeed. There is so much information about the PowerPC that it could fill a book. In fact, you can call Motorola at 1-800-845-MOTO for more general information about the PowerPC. Apple has announced upgrade paths for some existing Macintosh users and promises thid-party upgrades for others. Call Apple at 1-800-732-3131, ext. 150 for additional PowerPC Macintosh information.

For now, it is safe to say that the Apple Macintosh has had a very interesting 10-year history and that it promises to be just as interesting over the next 10 years. When the original Mac was introduced, no one really thought that we would be directing our computers to do things with voice command (and that they would talk back to us), playing CDs in the background and making movies, not in 10 at least. Who knows what we will do in the next 10 years as we move to even faster processors and the Macintosh picks up more capabilities. Hack, you will probably be listening to this article being read to you by some hand-held wireless system while you compose (using voice or pen and maybe a keyboard) your commentery on the 20th birthday of the Mac. Please be kind when commenting on how shortsighted thoses of us in the 90's were!

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

Confessions of a Former Mac Hater

How the AV Converted Me From a Casual User to an Addict

By Eriq Neale, ACS General Access Lab Manager (neale@unt.edu)

I can sum up my opinion of the new Macintosh AV technologies in one word: cool. This is not your average, everyday 'cool' though. It's one of those long drawn-out, very empathetic and emotional utterances of the word. A more appropriate spelling might be 'Coooooooooooooooooooooolllllll.....' And it would be followed by a meaningful smile. Cool. Yes indeedy.

Now that I've shared this professional, high-tech opinion with you, let me tell you how I arrived at it. I've been working with the AV technologies on my desk for about two months now. There was an incredibly high 'Wow-factor' upon opening the box, and I admit that I basically showed off for the next several days. I was amazed at all the stuff the machine could do, and I hope that my impromptu audience was equally impressed. If not, they did an excellent job of acting. Soon, though, the newness wore off and I was back to business as usual. Except that, in some cases, work life became a little more interesting.

The AV Product Line

The AV-based Macintosh models are two of the latest model rollouts from Apple. Named the Quadra 660AV and the Quadra 840AV, these computers are designed on the same technologies as the other Quadra units. Both run on the Motorola 68040 CPU (25MHz and 40 MHz, respectively), both sport the built-in FPU, both have built-in Ethernet and video, and both come with high-density floppy disk drives and can have optional CD-ROM drives installed. In just about every respect, these units are equivalent to other Quadra units, with the 840AV having the fastest CPU of any Macintosh ever.

What separates these Macintoshes from any other Mac ever made is the addition of an [AT&T DSP](#) chip and a new video and graphics architecture. The video subsystem allows for input and output of SVHS or composite video (NTSC, SECAM, and PAL formats for the techies). The DSP (digital signal processor) allows the AVs to process 16-bit, CD-quality audio both in and out of the computer. The DSP also can be used for telephony and data communications, emulating a 14.4k baud error-correcting modem in software. The understated crowning achievement of the hardware is that it now can interpret real-time speaker-independent voice commands through the DSP and some very elaborate software.

The one item that makes these machines very attractive, however, is the small price difference between the AV equipped Macintosh and a "regular" Macintosh. For example, a Quadra 660AV is roughly a couple hundred dollars less than a similarly equipped 650. And the Quadra 840AV is only a few hundred dollars more than a similarly quipped Quadra 800. So where Apple could easily have inflated the price on these units without difficulty, they chose to keep the cost competitive with the remaining product line, and the goal being to get this technology into the hands of those who might not have had it before. Like myself, for instance.

The Practicality of AV Technologies

As I mentioned earlier, the first few days I had my AV I spent mostly exploring the new capabilities of the machine. But as I got back into my working routine, it didn't appear the features would be all that useful. Voice recognition is nice, but is it really effective or useful enough for daily use? How often am I going to be digitizing digital audio? Since I don't have a CR or TV with cable in my office, how can I watch TV in the background, and am I going to be digitizing audio that frequently? My immediate answer to all these questions was negative. I didn't know at the time how the new functionality could work into my daily routine. I came to learn that dealing with this technology had a completely

different kind of learning curve

Admittedly, I'm writing this article from the experienced side of the coin now, and I've learned quite a bit about how the technology can be used. In fact, as I sit here typing away, I have a CD playing in the background from the internal CD-ROM drive. This is something that could be done before, but not in 16-bit stereo at 44.1kHz, which is CD sampling frequency. Anyway, I've found that in at least two cases with this computer, more is better. I refer to both internal memory and hard disk space in this statement. As I see it, to really take the advantage of more than one aspect of the AV technologies simultaneously, a minimum of 16MB of RAM is necessary. All the features can be used with less, but they'll be used at one time. Disk space is also a valuable commodity when digitizing audio or video, as files are created when doing this will generally be in the tens to hundreds of megabytes in size. A 230MB drive is minimum, 500MB is better and a 1GB or more is even better. An ideal configuration would be to have a 500MB internal drive and a 1GB or larger external drive. But, of course, not that many of us can go down to Joe's Computer Store and walk out with a high-capacity drive when the mood strikes.

Before continuing with my description of the different aspects of the AV technology suite, let me say that the AV is not for everyone. Every new Mac shipping today will play back stereo audio and digital video in the form of [QuickTime](#) movies. This functionality is present in the system hardware (audio) and software (video). If your interests lie in viewing multimedia applications or taking existing multimedia pieces and putting them together into a production, then you don't need the extra hardware on AVs. I'd suggest, in fact, that you take the savings on purchasing a lesser machine and put it into disk space or extra memory. But, if you want to generate multimedia at the elemental level by digitizing your own audio clips or capturing video or animations to disk, then the AV is an indispensable tool for you.

AV Audio

We'll begin our look into AV technologies with the enhanced audio capabilities. Since the introduction of the MacII, all Macintosh computers have been able to play 8-bit stereo audio with 8, 11, and 22kHz. You had to attach a set of headphone or external speakers to hear the stereo, but it was there. Several companies developed third-party solutions for capturing audio in stereo to the Mac, and in a few cases these add-ons could digitize at frequencies higher than 22kHz, but very few claimed to give full CD-quality 44.1kHz sampling.

The addition of the AT&T DSP to the AV Macs allows the computer to digitize and play back 16-bit audio clips in stereo from 8kHz to 48kHz, a higher sampling rate than CD. Headphones or external speakers are still needed to hear the stereo playback in full, but the Audio Visual monitor can be connected to the AV Mac to play stereo audio back through its built-in Bose speakers (and let me tell you, the audio quality of those little speakers is incredible!) Digitizing stereo audio is as simple as plugging a stereo input into the microphone jack on the back of the Mac and pressing the record button. Under System 7 ([System 7.1](#) comes shipped on the AV Macs), samples can be saved into system sound files, playable on any System 7 Macintosh, although some audio quality will be lost playing back a sound file on a non-AV Mac.

High-quality audio sampling is expensive in terms of disk space. At the highest-quality input setting, 16-bit stereo at 48kHz, 4 bytes are written to disk 48,000 times per second. That translates to about 190KB/second. For a three minute sound file, that equates to about 33MB on disk. Even though some audio enthusiasts insist that you can hear a difference in quality between a 48kHz sample and a 44.1kHz sample, many others will say the difference is indistinguishable. Even dropping down to 44.1kHz sampling, the same three minute audio file drops in size to around 30MB. A 22kHz sampling drops to 15MB. Dropping the recording quality to mono or 8-bit would halve each of these predicted sizes. The point here though is that we're a long way away from being able to copy our favorite CD onto 1.4MB floppy disk to play back on another computer.

AV Video

Capturing and digitizing video has become a popular activity, either for getting information for a multimedia presentation, or just for sharing clips from your favorite TV shows with friends (the latter activity violates copyright laws and is generally frowned upon). Video capturing boards such as the Video Spigot and Video Vision, from SuperMac and Radius respectively, have allowed Mac video junkies to digitize video into QuickTime movies for a

couple of years. These add-on cards tend to be rather expensive, though, and have generally been available only to true enthusiasts or the truly wealthy. Some of these solutions were combined with video accelerators so any video captured using them was replayable only on similar systems. Performance quality vanished completely if a movie was played back on a "regular" system.

The video subsystem on the AV Macs handily tackles this issue and another important one, displaying Mac video on an external monitor, like a TV. There are four video ports on the back of the AV Macintosh: an RCA composite video in, an RCA video composite out, an SVHS in, and an SVHS out. The AV Macs have an app called the FusionRecorder installed on the disk. This app, part of the VideoFusion QuickTime editing suite, allows you to capture video from the composite or SVHS input jack to a QuickTime movie. You can capture video at 160x120 pixels, 320x240 pixels, or at 640x480 (full screen resolution). Other video capturing applications may allow you to capture video at different resolutions, such as Passport Producer Pro that can capture at any custom resolution.

The "better is more" caveat applies here also. Each frame of a 160x120 video clip digitized in 8-bit color, minus audio, occupies 18.75K of space uncompressed. At 15 frames per second, each second of video occupies 281.25K of disk space. The larger resolutions and larger bit-depth captures get increasingly larger. To take the same image in 24-bit color format, each frame will occupy 56.25K of disk space uncompressed, while a second of video, captured at 15 frames per second, will occupy 843.75K of disk space. So, to capture full-screen images at full-motion speeds (30 frames per second) in 8-bit color, you need 8.79MB of disk space for each second of video, or 300K per frame. Needless to say, without some form of image compression, full-screen full-motion digitizing is not yet possible even on the Quadra 840AV.

QuickTime does have several compression algorithms available for digitizing and playing back video clips. In fact, QuickTime does not work with raw video. Every video clip digitized for QuickTime is compressed, even minimally. The compression algorithms offer a variety of compression ratios, but each has a price to pay. Generally, the higher the compression ratio, the poorer the video quality. Apple's highest-compression algorithm, called "Cinemark," compressed a two-minute video clip I digitized in 16-bit color from over 200MB to under 8MB of disk space. The quality on the final clip was usable and, given the relative newness of video clips in local presentations, still had a high "wow factor." The tradeoff? It took over 90 minutes to compress the clip. Of the four clips I digitized for the presentation, most were compressed right after I left work, during my lunch break, or while I was off at meetings. It's possible to do other work on your Mac while compressing in the background, but neither process benefits from doing so.

One does not have to digitize video to take advantage of the video technologies in AV, however. The AV Macs ship with Video Monitor, an app that displays a video signal from either the composite or SVHS input on the monitor at QuickTime window sizes (160x120, 320x240, or 640x480). This is handy for viewing video promotions, training videos, or "The Simpsons" (the latter being done off the clock or behind closed doors, also not recommended). Video Monitor can also "grab" a frame of video to the clipboard for inclusion in another program. This is highly useful for taking "video snapshots" of people or other objects for a variety of uses. You can simply connect a camcorder to the video while running Video Monitor and grab whatever the camera sees to the clipboard.

Video conferencing is not only popular in business and education these days, but also relatively easy to do with the AVs. A video conferencing program called ESoF2F ships on the AV that, when connected to a camcorder or other camera input, allows point-to-point video conferencing between Macs connected via Ethernet. This program only transmits video, not audio, and Ethernet is recommended because of the vast amount of video data being pumped across the network. We have tested this minimally across an Ethernet connection and saw fairly good throughput. I'd rather not think about what might happen across a basic AppleTalk connection. This demo application is upgradable to the full version that also handles video "whiteboarding," passing the Macintosh screen data as well as the video across the wire. How is audio handled in the full version? Same as the demo: pick up the phone.

And last, but not least, on our video tour, is the ability to direct the screen display to a TV monitor instead of a Macintosh or other compatible monitor. For years many third party solutions have been available that redirect the video output to a TV signal for display on TV monitor, or even to capture to videotape. This can now be done internally by telling the Monitors Control Panel to send the output to an external video source and connecting either a video camera

or VCR to the composite output of the Mac. This is useful for taping the screen activity for use in another type of production (such as a training video) or for demonstrating use in a training classroom where an LCD overhead display may not be available. The downside to this method is that the upper and lower portions of the screen are lost due to television's overscanning the video signal for display. Essentially, you lose the screen space of the upper and lower portions of the display. This can be somewhat annoying, especially when trying to display some use of the menu. In this arena, the third party video conversion solutions have an edge over the built in video. The use of an external monitor from the Mac disables the computer monitor, whereas other products display both images simultaneously. But, if your use will be mainly for presentations using slide shows (such as from a [PowerPoint](http://www.microsoft.com/mspowerpoint/default.htm) or Persuasion), the internal video output is more than sufficient.

AV Telephony

Another aspect of the DSP chip on the AV that I've been using frequently is the telephony capabilities. Through software, the DSP chip can emulate a 14.4kbps error-correcting fax modem. The GeoPort connects the DSP to the outside world through a variety of means, including standard telephone, ISDN, and others. Currently, only the telephone adapter is available, but others will arrive in the near future. The telecom adaptor connects a standard RJ11 phone line to your Mac, enabling the use of the fax modem. The GeoPort extensions extensions make the telecom adapter look like an Apple Express Modem. I use ZTerm to connect to our local 14.4 error-correcting dialups, AppleLink to get information from Apple directly, and America Online for entertainment. I've sent and received faxes on campus and across the country. I've even used AppleTalk Remote Access to dial into my Mac from a [PowerBook](#) out of town to read mail and copy files back and forth. All without purchasing a modem

Another app that ships with AV is ApplePhone. When used with a GeoPort and a microphone, ApplePhone turns your Macintosh into a speaker phone. This may seem quite toyish at first, but is useful for those of use who get cramps holding the phone with out shoulders while continuing to type at our keyboards. ApplePhone also has a built-in answering machine that will answer the phone after four rings, play an outgoing message, and digitize an incoming message for later retrieval. This application is basic in its functionality, but really shows the potential of the telephony applications to come. It's now possible to create a program that would allow your Mac to operate like one of those common (and oh, so annoying) voice mail systems that would direct call ("To speak with someone in sales, please press '1'"), take a message for a particular person ("Hi, this is Bob..."), and play back recorded messages over the phone line ("Press '3' to hear your messages"). There are now also headset devices that combine a microphone and earphone in a single unit for use with AV Macs. It's a dream device for shoulder cramp sufferers everywhere.

AV Voice Recognition

As I mentioned earlier, the voice recognition of the AV didn't really strike me as very practical when I first experimented with it. Sure, I could get it to select menu options from any application I had open. Sure, I could get it to select standard dialog box buttons. Sure, I could get it to shut off my Mac when I was done for the day (like I really ever turn it off, anyway). But except for a few bells and whistles, it didn't seem to be all that useful. That's when I discovered speech macros.

The Speech Macro Editor shipped with the AV is one of the workhorses behind the smoke and mirrors of speech technology. The speech macro library that comes with the AV will have your computer tell you what time it is, what day it is, and will even greet you pleasantly. This discovery led to a large number of speech response macros. For example, the computer's response to "Computer, location of Commander [Riker](#)" is "Commander Riker is not on board the Enterprise." Similarly, "Computer, when is Eriq's birthday?" results in "Eriq's birthday is January 4th." The wonderful part of this is that your AV could quickly become your dummy partner in a stand-up routine. Hopefully, the computer will have more important uses than that.

Still, though, this was all bells and whistles. These weren't really anything substantially useful that voice recognition could do. So, for a couple of months, "Computer" didn't listen to me (I turned it off). Then, when poking around in the Speech Macro Editor (while researching this article), I discovered that the speech macros were actually scripts, and

they could be based on AppleScript or QuickKeys scripts. This discovery led to two solid days of playing around with QuickKeys Test Drive (which comes shipped on the AV) and the QuickKeys scripting. After several failed attempts, I came up with some QuickKeys scripts that were actually useful. My personal favorite, and one I still use frequently, is a voice command that sets the color depth on my monitor. Some programs don't like to run in a video setting higher than 256 colors, so I have a voice macro that set the monitor to 256 colors and then runs the application. It sure beats opening the Control Panels folder, setting the video to 256 colors, closing the Monitors windows and the Control Panels folder, finding the application on disk, and running it.

I soon discovered the Script Editor application that comes on the AV which builds AppleScript or QuickKeys scripts and can save them as "executable" icons on the Mac. The script is nice because it will check syntax on all scripts before running them, and because it can save the scripts as stand-alone icons. It's then possible to create a script that can be run under a speech macro or just by double-clicking the icon without speech even running. Through the Script Editor I was able to begin looking into AppleScript a little deeper and created a number of scripts for use both with and without speech. The nice thing is there's only one script, and I reference it in the speech macro. I finally even found a way to get the speech macro to open my AOCE mailbox. (I won't tell you how that was done. If you want to know, you'll have to ask.) The end result is that I'm now leaving voice recognition turned on most of the time and am making use of it in my day-to-day operations, thanks mainly to the scripting extensions. And I use it to help me remember important birthdays and anniversaries. ("Computer, when is Anna's birthday?")

AV Roundup

I guess the final question comes to this. Could I live my life without an AV Macintosh? The answer is a definite 'yes.' I'm not any more productive doing what I normally do daily, although voice recognition has shaved some processing time off repetitive tasks. With the AV technologies, however, I have a completely different world of opportunity at my fingertips. Training applications and tests or quizzes can be easily created with audio and video components. Fax and data communication are simplified and quicker on the computer. And voice recognition is not only really cool and mostly useful, but it has the most growth potential for the entire computer industry of any new technology. All in all, the AV technologies are very impressive and affordable, and I hope industry realizes the capabilities and future opportunities they offer. And you, my friend, should go out there and test drive one.

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

Everybody's Doing It - Mac in a DOS World

By Sean McMains, Microcomputer Consultant mcmains@unt.edu

You want a new computer. You've decided that the [Macintosh](#) is the machine on which you work the best, so you tell your boss that; what you want. You explain the graphic user interface is very polished and that it helps minimize the learning curve for new applications, allowing you to spend less time digging in manuals and more at work. You tell him about the built-in multimedia features. Everything is going along smoothly until the boss asks the dreaded question: "Is it [DOS](#) compatible?" You hem and haw for a few moments, look down at your shoes, and finally look him in the eye and say "Why, yes. Yes it is."

When the Macintosh was first introduced, it was perceived as a toy computer. Not only did it have little pictures and cute graphics that were out of place on "serious" computers, but it didn't work with anything else on the market. As the PC Compatible market boomed and the Mac line became more capable and powerful, this rift was widened by Apple's continued determination to keep their system software in-house and unable to be reproduced by anyone. As a result, no one was able to develop clones of the Macintosh in the same way that had been done for the IBM machines, and the gulf between the two platforms remained unbridged.

Macintosh and DOS Compatibility

This is what we in the computer industry like to call a "third party opportunity." Seeing that there might be quite a demand for machines that could handle DOS software as well as Macintosh software, several companies developed products that would allow one to do just that. The two biggest players in this arena up until recently have been [Orange Micro](#) and [Insignia](#) solutions.

These two companies have developed different approaches to running DOS software on a Macintosh. Orange Micro's solution uses a coprocessor, while Insignia uses something called a "software emulation." Each of these technologies has its advantages and disadvantages, and might be used for different applications.

Basically what Orange Micro has done is to have designed a board that is essentially a PC-compatible computer on a card that sits inside the Mac and runs the DOS software while the Mac's CPU continues to take care of Mac software. The advantage to this arrangement is that it essentially provides the user with two complete computers in one box, allowing one to run different kinds of programs simultaneously and without one environment affecting the performance of the other. When performance is of primary importance, this makes for an excellent solution.

Insignia has taken a very different route with their [product](#). They have basically written a program to pretend that it's a DOS machine, and to fool the DOS software into believing it as well. The advantage of this approach is that Insignia's software can tell DOS programs anything it wants about the machine configuration, and as long as it provides the necessary illusion, everything will work fine. The practical result of this is that one can use the Macintosh's mouse, serial ports, networking capabilities, etc., and all seem to the DOS program to be exactly what it would expect. This approach is also much cheaper than the coprocessor approach, as there's no extra hardware to pay for.

The Apple Solution

Recently, Apple has made this market a bit more interesting by introducing a product of their own, the [Quadra 610](#) DOS compatible. This is a Macintosh Quadra with a built-in coprocessor to allow it to run both DOS and Macintosh software. It is somewhat less capable than Orange Micro's solution, but for the \$500 over what a Quadra would normally cost, it's hard to argue with the price.

One of the most exciting developments in this area that will occur soon is the introduction of the [PowerPC based Macintosh](#). Up to now, all Macintoshes run on the 68000 series of microcomputers. In April, Apple will begin

migrating the Macintosh line over to a new kind of processor, called the PowerPC, which promises to provide performance increases of 200%-400% over the current chips. In addition, work is well underway that will allow these machines to run many different operating systems, including DOS, Macintosh, [Windows NT](#), UNIX, and others, resulting in one box that will run just about any software that's out there. The PowerPC Macintoshes will use software emulation to do their magic, but since their chips are so much faster than the existing ones, they should be able to provide performance comparable to the older processors when running code written specifically for them. Of course, code written specifically for the PowerPC will race past that which has to run in emulation mode.

Though historically the worlds of DOS and Mac have been entirely separate, the major vendors have finally begun to acknowledge that most environments are not solely Macintosh or solely PCs, but a combination of the two. This has opened the door to an unprecedented degree of interoperability between the two platforms, and has finally allowed us to have our Mac and PC as well.

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

Newton Envy

By Sean McMains, Microcomputer Consultant (mcmains@unt.edu)

[Apple's Newton MessagePad](#) has been one of the most hyped, most expected, most raved about, most maligned, most publicized, most criticized piece of personal electronics to hit the market in a long time. You've probably seen the commercials, which are long on flash and short on substance, and may have even seen [Saturday Night Live's](#) parody of the Newton in the form of their "McIntosh Post-It Notes" commercial (Versatile. Intelligent. Sticky.) Even Gary Trudeau has gotten into the act, with a lengthy series of Doonsebury comics poking fun at its abilities.

So what is this little device? What does it do? And why the furor surrounding it?

"What is it?" That's a harder question than one might expect to answer, as the Newton has defined a new class of product: a "Personal Digital Assistant," or PDA for short. (The other product that falls squarely in this category is the [Tandy Zoomer](#).) PDAs are not as capable as a full-featured laptop in some respects, but they outshine the general purpose machines in other areas. PDAs are optimized to help an individual to keep track of the myriad little pieces of information that she gathers, including names and addresses, appointments, notes, sketches, to do lists, etc. They generally cost right around \$700 - significantly more than a Wizard-style product, but much less than a full-featured laptop computer, such as the [ThinkPad](#), PowerBook, or EO (a pen-based computer from [AT&T](#)).

So why the extra \$400 again over the top of the line Wizard organizers? PDAs are a far more general-purpose kind of device than are the lower-cost organizers. The Newton can not only keep track of the previously mentioned information, but can also send and receive electronic mail over the Internet, can send faxes, can reformat any of your notes and print them on 8.5X11 paper using any [PostScript Laser Printer](#), can receive alphanumeric messages over a pager network, and can exchange information easily with other Newtons using an infrared link that only requires you to point the units at each other. Additionally, the Newton can store more software in RAM, so that you can add functionality to the machine in the same way that you would a computer - just load up a new program.

In addition to all the built-in functionality, there are all kinds of software packages currently under development for the device. Fodor has already released a Newton-based guide to various cities in the United States, so that while traveling, one could ask the Newton if there were any five-star Chinese food restaurants within walking distance of one's hotel, and it would respond with a phone number so you can make reservations and directions from your hotel. There's a program that provides a map of the [Washington DC subway system](#), along with all of the stations' names and which lines stop there. Medical students have developed software to allow them to access information quickly and easily about the interactions of various drugs. Terminal emulation software is close to release as well, which will allow the Newton to dial into [Compuserve](#), local bulletin board systems, or even [UNT](#)'s host systems. Finally, spreadsheet and database applications are already released or will be shortly.

Much of the commotion that has surrounded the Newton centers around some of its unique capabilities. Since the unit is too small to include a regular keyboard, Apple developed some excellent handwriting recognition software that would allow a user to write in print or cursive on the unit and have that writing converted into text that the unit can understand. Unfortunately, the moment that many individuals heard "handwriting recognition," they expected perfection, which Apple has decidedly not delivered. Newton's handwriting recognition is excellent - by far the best I've ever had the pleasure to work with - but it's not infallible. For one thing, it does require a day of training with your particular handwriting style before it will do very well. Many people also assumed that they would be able to write just like they always do, but that is not the case. It takes a bit of time to get used to what the Newton expects to see in one's handwriting, just as it takes time to learn how to type. Learning how to use writing effectively on a Newton is certainly a much faster process than learning how to type, but it is not instantaneous as many expected it would be.

Answering the Charges

Another charge leveled at the emerging class of device is that they're just too expensive. This is true if one is thinking of them only as the equivalent of an electronic Rolodex. However, the additionnal communication functionality as well as the ability to load and use many other kinds of software as well provide those units with a far broader range of functionality than these less expensive devices have. Looking at the from the other direction, they don't quite do all the neat things that one can do with a good laptop machine, but they certainly cost a lot less as well. Additionally, they're actually portable enough to take with you wherever you go, a claim that cannot be honestly made by the full-featured laptop computers.

Ordering My Life

In the month since I got my Newton, it has already become indispensable to me. The electronic calendaring functions have ordered my chaotic schedule, and the alarm function has certainly gotten me promptly to appointments I might have otherwise forgotten. Having contact information for both friends and businss associates at my constant beck and call has proven most valuable. In addition, my Newton is currently loaded up with several games to while away the extra time that occasionally presents itself in the lines at the supermarket ([Yahtzee](#) is a current favorite with friends), a program for tuning my guitar, various books for my enjoyment (currently [Heart of Darkness](#), [The Jungle Book](#), and [The Adventure of Black Peter](#)), a [sign language reference work](#), and a network analysis tool.

It Could Be for You

The Newton is not for everyone. However, it does provide a great means for some people of organizing all the information that is often so difficult to keep up with, as well as offering a fairly powerful computing platform that will fit in the palm of your hand.

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

Purchasing a Macintosh or Other Apple Product at UNT

By Eriq Neale, ACS General Access Lab Manager (neale@unt.edu)

UNT has a purchasing contract with [Apple](#) Computer that gives University faculty, staff, and students easy avenues for purchasing Apple products, including [Macintoshes](#) and the new [Newton Message Pad](#). Faculty and staff wanting to purchase Apple Computer equipment for their offices on campus can deal with UNT Purchasing directly. Most Apple Computer equipment is on the State Price Contract, though our Higher Education Purchasing Contract gives us prices that are better than those listed on the State Contract. Current prices can be acquired from Purchasing or from Sean McMains in the Computing Center.

Apple Products for Personal Use

Students, faculty, and staff wanting to purchase an Apple product for personal use can deal with Apple Computing directly or through the University Store or [Academic Computing Services](#). Apple has instituted an 800 number for ordering products using a credit card or after having secured an Apple Computer Loan. While anyone can call and order products using this number, students, faculty, and staff are eligible for special pricing on equipment not available elsewhere. To get special pricing when placing an order, a PIN must first be generated. Apple uses this PIN to verify eligibility for the special educational pricing. Anyone can get this number through the University Store, and students can also get the number from Eriq Neale at Academic Computing Services. Eriq Neale can also provide purchase consultation for students wanting to buy a Macintosh or other products. Both locations have educational pricing information on hand.

The ordering process is simple. Once you've decided on buying an Apple product, you can get your PIN generated. Then you call 1-800-877-HIED, give them your PIN, and place your order. Based on availability, your new computer could be on your doorstep in just two weeks.

The Apple Computer Loan

If you don't have a large enough credit limit on your credit card or charge card (like me), the Apple Computer Loan could help. Students, faculty, and staff can call the Apple Loan phone number and have their application taken over the phone. If you are approved, you will get an authorization code that you can give to the Apple order line to complete the purchase transaction. Information about the loan is available from both the University Store and Academic Computing Services. The loan is limited to enrolled students and full-time faculty and staff.

Any questions regarding the purchase of Apple Computer equipment on campus may be directed to Academic Computing Services, 565-2324.

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

Macintosh Emulation on Unix Workstations

Marc Thacker CWIS Coordinator (thacker@unt.edu)

As [Apple](#) Computer makes moves into the [PowerPC](#) arena, one hears more talk about the future of the Macintosh environment being available on more than one hardware platform. Of course, Apple will ship PowerPC Macintosh computers, running a version of Apple's [System 7](#) operating system soon. However, there is one other major market that Apple wants a share of: the UNIX workstation market. To this end, Apple and other companies have made moves and products to allow people with UNIX workstations to run Macintosh applications on their machines. By allowing UNIX based products to run Mac applications, Apple and other vendors hope to ensure that the Macintosh marketplace will grow - and that it wouldn't depend so much on hardware from one vendor, Mac.

This article covers three different methods of allowing Macintosh applications to run on UNIX based machines. Technically there is a fourth, Apple's own UNIX implementation called [A/UX](#). This software actually runs UNIX on top of existing Apple hardware with the regular Macintosh System 7 running as a background process within it. However, I wanted to focus on non-Apple hardware Unix-based machines. So, the real question is "How can I get the Mac version of <fill in your favorite application here> to run on my <name of some major UNIX-based workstation?>" There are two current solutions and one potential solution that are covered in this article.

Quorum Equal & Latitude

The approach taken by [Quorum](#) has been to not worry about emulation a Macintosh, the Macintosh operating system or even the [Motorola](#) 680X0 chip in the Mac; rather, their software modifies existing off-the-shelf applications to run with an [X-Window](#) user interface. Their package, Equal, is available for [SPARC](#) and [Silicon Graphics](#) machines and allows particular Macintosh applications to run in the UNIX operating system while using the host machine's user interface via an X-Window. Hence, if you are running [Motif](#) or Openlook on your UNIX system, you would get Mac Microsoft Word running with a Motif or OpenLook interface.

This program spawns most likely from their work on a companion product known as Latitude. This is a developer's tool that allows MACintosh applications to be compiled to run on UNIX systems and use the X-Window user interface. Because the program is not running under any sort of Macintosh emulation mode, there are four things that limit Equal's success:

- The interface is that of the X-Window system, not the Macintosh. Hence even dialog boxes and file navigation options will appear and function differently.
- Each application must be ported seperately. Right now only Microsoft Word and Excel are available.
- No Macintosh services such as networking, Quicktime, sound and others are available for the application. Hence, don't look for a multimedia development package to be ported to Equal anytime soon.
- Since there is no Finder, CPU or operating system emulation, programs that use direct calls to any of these may not work. Obviously programs that make calls directly to the hardware will not work at all and will probably never be ported to Equal.

Equal and Latitude will be interesting to watch, but I doubt that they will capture any of the real market that Apple is shooting for with the Mac on UNIX goals. For now, if you really need to run the Mac version of Microsoft Word and Excel, then you could consider Equal. But, with other alternatives available, you may not want to.

[Andataco](#) Liken

Liken is a program written to be a more general Macintosh emulation package. It does have ots own drawbacks however. Liken emulates a System 6.0.7 system, monochrome Macintosh with sparse networking or floppy disk capability. It is available for Sun SPARC and HP RISC machines and requires at least 16 Meg of RAM (normally not a

problem on UNIX machines). It does offer the advantage that the Macintosh look-and-feel is preserved within an X-Window on the UNIX host.

The program runs the Macintosh operating system (one that is basically over two years out-of-date) within an X-Window on the UNIX host. This means that the entire Mac look-and-feel is preserved because programs think they are running on a Macintosh. As a result, applications do not need recompilation to run in Liken. It is worth noting that there is no emulation of any particular Motorola CPU in Liken, just emulation of the operation system. Hence, programs making calls to specific chips on the Mac motherboard, or those violating Apple's programming rules (even some of Apple's do this) will probably not work under Liken.

So far, it doesn't sound too bad, or does it? There are several key items to consider before rushing out and purchasing Liken. Since Apple did strange things to get the once-common 800K format Liken doesn't solve this problem either, allowing support only for whatever the host UNIX machine has a floppy drive; generally this is a 1.44 Meg floppy. This means that all of the software you get from manufacturers that ships on 800K floppies will be unusable in Liken.

Also, Liken only supports text cut-and-paste and a monochrome Mac screen. So, you can have millions of colors available to you on your UNIX machine and only have a black-and-white Macintosh screen, and you will only be able to cut-and-paste test strings between your other X-Window sessions and the Liken session.

Since only the single-application mode of System 6.0.7 is supported, you can not run more than one Mac program at once, unless you fire up another copy of Liken in the background on your UNIX host (basically then emulating two or more Macintosh systems).

The "virtual Mac" can access any file system that the UNIX system can, but Appletalk support is limited to only a bare handful of applications on the Macintosh side (mainly E-mail programs at this point. So, don't count on being able to access other Appleshare/Netware file servers with Liken. Speaking of networking, there is also no support for serial ports, so your Mac applications can not access a modem or other device normally available.

Oh yeah, speed. Liken does a reasonable job of executing, but even on a fairly well equipped UNIX host, it is very likely that a mid-range Macintosh will outperform Liken. Given the amount of emulation that Liken is doing, this is still fairly respectable.

The most interesting part of Liken is that it is closest to the way that Apple wants to do emulation of the Macintosh on Unix. It is also the closest in concept to a product from [Insignia](#) called [SoftPC](#) or [SoftWindows](#), in which an MS-DOS compatible is completely emulated on a UNIX (or Macintosh) machine. Insignia went one step further than just emulating the operating system as their software emulates the actual hardware as well and has proven to be very bulletproof as a result. Andataco has promised a System 7 version of Liken, but no official word has been given concerning color or specific Motorola CPU emulation.

Apple Services for Open Systems

Vaporware. Yep, all products are as perfect as vaporware. This suite of product however, does indeed promise to do something not really done before - allow Macintosh applications to run at near native speeds on UNIX hosts without recompilation. They also promise one other thing: an officially supported Apple method of moving to open systems standards with the Macintosh environment.

Apple has been working to allow the Finder and other off-the-shelf applications to run under IBM's [AIX](#) UNIX operating system since they announced the joint IBM-Apple-Motorola PowerPC project in October 1991. From this, it is believed, that Apple has rewritten major portions of the Macintosh operating system and Toolbox (the "look-and-feel" portion of the Mac) into a portable form allowing it to be compiled onto a variety of UNIX host machines. Since the OS and Toolbox would actually be UNIX applications, native UNIX systems to handle input/output and graphics drawing would be used when a Mac application calls for them. So, the speed of software running in this environment should be fast as well

Officially, Apple has announced that it will ship native versions of the Macintosh Toolbox and A.P.I. (Applications Programmer Interface) for IBM's AIX, Sun's Solaris, [Hewlett Packard's HPUX](#) and Univell's [UNIXware](#) (UNIX on Intel machines from [Novell](#)). Apple has also said that they will allow major applications and certain system enhancements to run unmodified in a single X-Window on a UNIX system. Support for system extensions such as [Quicktime](#), [AOCE](#), [Quickdraw GX](#) and others will also be provided. In addition, developers will be able to write UNIX applications that take advantage of the Macintosh system extensions while still remaining UNIX applications (Quicktime movie viewers for Sun machines for instance). These last two items are what mark the difference between Apple's intentions and the other two alternatives above.

Apple's first real test of this idea is with PowerOpen, the joint UNIX operating environment from Apple and IBM. Here, Apple is integrating its own UNIX implementation, A/UX with IBM's AIX UNIX onto the PowerPC (and other) CPU. PowerOpen will offer the ability to run "personalities" of different systems, including the Macintosh. Originally, Apple said that the Mac personality would include a Motorola 68040 emulator, and emulated versions of the Macintosh Toolbox and ROMs. This was to be accomplished using a binary translator package known as FlashPort, which translates a Macintosh program directly to a UNIX executable program. Since the initial announcement, Apple has since backed away from this method and has gone with the more reliable alternative of actually recompiling the Toolbox and Finder to run as UNIX applications.

So, when can we see something? Remember that word "vaporware"? Apple originally said they would have something for the Sun SPARCstation machines by the end of 1993. Well, I haven't seen anything, have you? Rumor has it that first quarter 1994 is the new deadline for having something available. Isn't it curious that this would happen to coincide with the introduction of the PowerPC Macintoshes? I would not be too surprised to see the PowerOpen portion of the project on schedule with something released by then as well. PowerOpen promises to do a variety of things as well, including running multiple "personalities" on multiple hardware platforms.

Does a Solution Exist?

If you need to run a variety of Macintosh applications today on your UNIX workstation and you don't mind putting up with some limitations, Liken is probably your best choice. If you have a Mac on your desk and you just need to run UNIX, this article was not the one that you should have been reading! There are at least two good solutions to that problem as well (for later articles of course!) The wise buyer will adopt a wait-and-see attitude for this particular subject. Apple is making major noise about wanting to be an open company. An official Apple solution to the problem of the Mac on UNIX will come, but who really knows what form it will take?

References

- "Mac apps to find a new home on UNIX turd," [Macweek](#), May 17, 1993
- "Mac apps find home on UNIX," *Macweek*, January 1, 1993
- "Mac also rises on Sun Workstations," *Macweek*, January 1, 1993

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

Internet Tools for Macintosh

[Dr. Philip Baczewski](#), Assistant Director of Academic Computing Services (ac12@unt.edu)

Any computer attached to the campus Ethernet network has access to the Internet; however, the Macintosh has some particularly friendly tools available for Internet access. The Macintosh, because of the nature of its graphical interface, can provide some unique views and methods of accessing Internet resources

The article provides an overview of the tools that are available to perform various network tasks. This article also assumes some knowledge of Internet services. Most of these programs are available on a no or low cost basis, and a source for each program is generally provided with each description. If you require assistance in acquiring any of these programs or would like more information, contact Sean McMains (mcmains@unt.edu; 565-2039), Eriq Neale (neale@unt.edu; 565-4808), Mark Thacker (thacker@unt.edu; 565-2568), or Philip Baczewski (ac12@unt.edu; 565-3886) at the UNT Computing Center (ISB 119).

[Pegasus Mail for the Macintosh](#)- Pegasus Mail for the Macintosh can be run on systems that are connected to the campus network as well as supported by a Novell file server that provides Macintosh services (currently around 16 on campus). Pegasus mail can provide Internet mail service directly from the Macintosh. Not only will it allow you to send mail to others at Internet sites, but it will also allow you to subscribe to BITNIT and Internet mailing lists. As the campus moves to a more unified microcomputer electronic mail system, one priority is to be sure that Macintosh computers are equal players in the mail arena. If you have questions in regards to your machine's access to Pegasus mail, contact your Novell Network manager or contact Mike Murdock (murdock@cc1.unt.edu; 565-4314) at the UNT Computing Center.

[MacTCP](#)- MacTCP is an addition to your Macintosh's operating system. MacTCP supports a transparent interface between the various networking programs and the TCP/IP network (in this case, the Internet). Once MacTCP is installed, you will probably not ever use it directly, however, a number of the programs discussed below will use it as their access point to the Internet. [Academic Computing Services](#) currently maintains a site license for version 1.11 of MacTCP. If you wish it to be installed on your Macintosh, contact Sean McMains (mcmains@unt.edu; 565-2039) at the UNT Computing Center.

[Telnet](#)- The Computing Center supports [NCSA](#) Telnet version 2.5 for the Macintosh as the Internet VT100 remote login solution. No only will this program provide access to our on-campus host and card catalog systems, but it will also let you connect to remote library card catalog systems and a number of other Internet services. If your Macintosh is connected to the Campus Ethernet network, you can copy NCSA Telnet from Academic Computing Services' AppleShare server named Mimas. Use Chooser to select the AppleShare services in the ISB ACS zone and then connect to Mimas as Guest. You'll find the NCSA Telnet self-extracting archive on the "Best of Macintosh" volume in the "Mac Internet Tools/Telnet" folder. If this procedure won't work for you, contact the Computing Center for assistance.

TN3270- TN3270 is the Telnet equivalent for accessing IBM mainframes. It will allow you to establish a remote-login connection over the Internet to mainframe systems and do the appropriate terminal emulation. The version of TN3270 for the Macintosh that is available was written at Brown University. BrownTN3270 is also handy if you use the UNT's Academic mainframe system. Like Telnet, this program is available on Mimas, on "Best of Macintosh" in the "Mac Internet Tools/TN3270" folder.

[Fetch](#)- Fetch is a very nicely written program to perform ftp file transfers to and from remote sites. Fetch was written by at [Dartmouth College](#), a campus that makes extensive use of Macintosh computers, and Fetch is free of charge to educational users. Fetch offers a Macintosh-style interface for connecting to anonymous ftp sites and retrieving files. It will also automatically decode files of various compression and text encoding types. For example, if a file you fetch from a remote site is in Binhex format, Fetch will perform the file transfer and then open a window for you to specify where to save the decoded version of the file. Fetch can also do the same for

the popular public domain compression program formats. Another nice feature of Fetch is its ability to analyze a file and determine what type it is. The program lets you specify whether the file transferred will be text or binary. There is also an "Automatic" selection which causes Fetch to attempt to determine the file type, in almost all cases successfully. This ability, combined with the automatic conversion features, makes Fetch one of the easiest Internet tools to use. Fetch is available on Mimas on "Best of Macintosh" in "Mac Internet Tools/FTP/Client."

TurboGopher- TurboGopher is one of the best ways to gain access to the Gopher system that UNT is using as the basis for its campus-wide information system. TurboGopher makes use of the Macintosh's graphical interface tools, or as some put it, "Mac things," to create an intuitive interface to the resources available from Gopher services. When using TurboGopher, it is also necessary to have NCSA Telnet and Brown TN3270 installed in order to have full access to the resources available via Gopher. You can find TurboGopher on Mimas on "Best of Macintosh" in "Mac Internet Tools/Gopher/Client." For more information about Gopher, see the November/December 1993 issue of *Benchmarks* or contact Mark Thacker (thacker@unt.edu; 565-2568).

News Readers- Several USENet news readers are available for the Macintosh, and there has yet to be a standard set for supporting one here at UNT. Each of the following has some good features, but none has yet been identified as being best suited for our needs on this campus.

Nuntius: Nuntius is a news reader program that is "freeware," meaning that while it is copyrighted, there is no charge for its use. It has very nice Macintosh-style hierarchic interface, with groups of groups represented by a file icon. However, because Nuntius is written to support a mail program called [Eudora](#), no direct mail services are available when using this program here on the UNT campus. Thus means that while you can post news messages, direct replies to the original poster are not possible, and news messages cannot be forwarded to other people's mail addresses.

NewsWatcher: NewsWatcher is another freeware program for reading Network News on a Macintosh. It has one advantage over Nuntius in being able to reply to a message via E-mail. Like Nuntius, forwarding messages to other mail addresses is not possible. While it has a graphical user interface, it is not as hierarchic as that of Nuntius.

InterNews: Internews is a news reader written at Dartmouth College and is free for use at Educational institutions. In addition to its news reading capability, InterNews has some built-in mailing functionality for forwarding news messages or replying directly to a news message's author. Unfortunately, the InterNews user interface is not as "Mac-like" as the previous two programs, however, its functionality makes it a candidate for a supported package here at UNT.

If you are interested in more information about Macintosh news readers, contact Mark Thacker (thacker@unt.edu; 565-2568) at the UNT Computing Center.

MacX- MacX is a software product from [Apple Computer Inc.](#) which implements X Window server software on the Macintosh. MacX can use the Macintosh's graphical interface as its window manager. The Computing Center currently maintains a site license for MacX version 1.1 which will work with Macintoshes running System 6. For those using System 7, you will need to purchase a right to update license for \$17.00 which will entitle you to have version 1.2 installed. For more information, contact Sean McMains (mcmains@unt.edu; 565-2039) at the UNT Computing Center.

Mosaic- Mosaic is the newest entry to the suite of Internet tools. Mosaic is a free program written by the National Center for Supercomputer Applications (NCSA, also the Telnet folks). Mosaic provides access to diverse Internet resources including World Wide Web servers, Gophers servers, ftp sites, and WAIS databases. Mosaic uses a graphical interface as its navigational tool and its concept is quite suited to the Macintosh environment. Mosaic requires that MacTCP be installed on your machine. Be forewarned that the Macintosh version is still a bit buggy and tends to be a memory hog. If you are interested in trying it out, you can retrieve it via anonymous ftp (or via Fetch) from <ftp.ncsa.uiuc.edu> in the "/pub/mosaic/macintosh" directory

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

The Internet Connection

By [Dr. Philip Baczewski](#), Assistant Director, Academic Computing Services and BITNET INFOREP (ac12@unt.edu)

□ This column is a continuing feature of **Benchmarks** intended to present news and information on various aspects of wide area networks.

A Brave New Internet

As I hinted in the last *Network Connection*, there are some changes looming in the operation of the group of networks we know as the Internet. You may have caught news reports of [Vice President Gore](#)'s proposal to restructure the communications industry in the U.S. The administration's proposal seeks to reduce regulation on the telephone and cable TV industries and encourage the development of a new level of electronic information access for U.S. households. If implemented and successful, the new policies will have a definite effect on who and how many will have access to the Internet.

Changes to the Internet as we now know it may happen even sooner. Currently, much of the Internet traffic is carried on the [National Science Foundation](#)-subsidized NSFnet. This network was developed primarily to support communication to the NSF-funded supercomputer sites, however, another result has been the development of a national networking infrastructure that includes local sites, regional networks, and national communications providers. The most recent legislation implementing the concept of a [National Research and Education Network](#) (NREN) is encouraging the privatization of a number of services which to date have been subsidized.

The biggest noticeable change which is looming on the horizon is the restriction of traffic on the NSFNet to communication only from member Supercomputer sites. While this is the current mission of the NSFNet, it also currently allows any two NSFNet member sites to communicate with each other. Such a restriction in NSFNet traffic obviously has serious implications for the Internet as we now know it. If the NSFNet is not going to be the primary communications path for the Internet, then an alternate solution will be needed.

Fortunately, a number of companies are ready to begin providing Internet services in the wake of the proposed changes. [Sprint](#), for one, has developed an extensive fiber-optic network in the U.S. and is poised to become a major player in data networking services. Other companies are also gearing up to provide network access. From the University's standpoint, there may not be noticeable change. We will most likely remain members of one or both of the regional networks in [Texas](#), [Sesquinet](#) and [THENET](#), and they in turn will contract with a service provider for the Internet access. The NSF is providing grants to educational organizations to help ease the conversion process from a primarily subsidized operation to a mostly private infrastructure.

One of the main benefits of the change in the Internet should be the extensive development of private Internet services. It is already possible to contract with a private service provider to get Internet access from your home. The trend toward more reliance on commercial network providers should greatly increase the number and extent of services available to private households. The year 2000 may see us truly in the midst of the Information Age.

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

FBI Asking For Help in UNABOMB Case

This message has been posted in various places throughout the Internet

The [FBI](#) would like to make you aware of its investigation concerning the [UNABOMB](#) case. We have made the UNABOMB information available to you in the following ways:

- Anonymous FTP: Host: [naic.nasa.gov](ftp://naic.nasa.gov)
Directory:/files/fbi Files: README,
UNABOM-press-release.txt URL:
<ftp://naic.nasa.gov/file/fbi>
- Gopher: Type=1 Name=F.B.I. Gopher
Path=1/government-resources/fbi
Host=naic.nasa.gov Port=70 URL:
[gopher://naic.nasa.gov:70/11/
government-resources/fbi](gopher://naic.nasa.gov:70/11/government-resources/fbi)
- World Wide Web: URL: [http://naic.
nasa.gov/fbi/FBI_homepage.html](http://naic.nasa.gov/fbi/FBI_homepage.html)

The information presented on the Internet about the UNABOM investigation has been made available publically before. Recent electronic media presentations include: CBS's "Eye to Eye" with Connie Chung (12/16/93), and Fox's "America's Most Wanted" (11/23/93). Print media stories about the UNABOM investigation have also appeared: [Washington Post](#) (11/27/93), [New York Times](#) (10/7/93), etc.

The purpose of submitting the information on the Internet is two-fold. First, the Internet is another medium that enables us to reach as wide an audience as possible; to "spread the word." Second, Internet users are precisely the type of individuals that to date have been recipients of explosive devices attributed to UNABOM: scholars and researchers.

You are not being asked to place yourself in harm's way. You are encouraged to come forward if you have information that might help identify, arrest, and convict the person(s) responsible for these bombings. Contact the UNABOM Task Force at 1-800-701-2662.

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: WWW@unt.edu

The Internet Index

Compiled by Win Treese (treese@crl.dec.com), 7/8/93 Revised: 12/16/93

- Annual rate of growth for Gopher traffic: 997%
- Annual rate of growth for World Wide Web traffic: 341,634%
- Average time between new networks connecting to the Internet: 10 minutes
- Number of newspaper and magazine articles about the Internet during the first nine months of 1993: over 2300
- Number of on-line coffeehouses in San Francisco: 18
- Cost for four minutes of Internet time at those coffeehouses: \$0.25
- Date of first Internet mail message sent by a US President: 2 March 1993 (Sent by Bill Clinton, President of the United States)
- Date on which first Stephen King short story published via the Internet before print publication: 19 Sept 1993
- Number of mail messages carried by IBM's Internet gateways in January, 1993: about 340,000
- Number of mail messages carried by Digital's Internet gateways in June 1993: over 700,00
- Advertised network numbers in July, 1993: 13,293
- Advertised network numbers in July, 1992: 5,739
- Date after which more than half the registered networks were commercial: August, 1991
- Number of Internet hosts in Norway, per 1000 population: 5
- Number of Internet hosts in United States, per 1000 population: 4
- Number of Internet hosts in July, 1993: 1,776,000
- Round-trip time from MIT to mcmvax.mcmurdo.gov in McMurdo, Antarctica: 640 milliseconds Number of hops: 18
- Number of USENET articles posted in two weeks during February, 1993: 35,000
- Number of megabytes posted: 44
- Number of users posting: 80,000
- Number of sites represented: 25,000
- Number of Silicon Valley real estate agencies advertising with Internet mail addresses: 1
- Terabytes carried by the NSFnet backbone in February, 1993: 5
- Number of countries reachable by electronic mail: 137 (approx.)
- Number of countries not reachable by electronic mail: 99 (approx.)
- Number of countries on the Internet: 60
- Amount of time it takes for Supreme Court decisions to become available on the Internet: less than one day.
- Date of first National Public Radio program broadcast simultaneously on the Internet: 21 May 1993
- Percent of Boardwatch Top 100 BBS systems with Internet Connectivity: 21
- Number of people on the Internet who know you're a dog: 0

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

List of the Month

Each month we will highlight one BITNET, Internet, or USENET Special Interest Group (SIG) mailing list. This month's list...

Kid Media Discussion List kid.media@airwaves.chi.il.us

Owner: William Pfeiffer wdp@uiuc.edu

The Kid Media Mailing List is a list (started Nov 23 1993) dedicated to the furtherance of communications between people interested in, or involved in, the creation, production, distribution and/or consumption of media whose primary target audience is children. For the sake of inclusiveness, the list is defining children as anyone under the age of 18 years, although most of the media to which this list is targeted would be aimed primarily at those under 12.

As a general rule, Kid Media is open to any constructive traffic on the topic. We are counting on the participants to bring the list to life, as it is being run as a tool of communication and not a podium for one or two so-called "experts."

Some of the topics suggested for discussion are (but not limited to): Children's Public Television programs and their impact; Kid's Music and Musicians; Producing Children's media; The role of computers and computer animation in Kid's media; How Kid's Media deals with Societal Issues like [AIDS](#), [Sexuality](#); Family problems, [Abuse](#), [Racism](#), [Drugs](#), Self-Esteem, etc.; Education via media; [Kid's movies and videos](#).

To Subscribe/Unsubscribe or get a help file, send mail to: kid.media-request@airwaves.chi.il.us You MUST put one of these commands in the SUBJECT: field of your letter: 1) Subscribe 2) Unsubscribe 3) Help

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

Information Infrastructure Task Force Announces Computer Bulletin Board

Press Release: Thursday, December 16, 1993

Larry Irving, Assistant Secretary of Commerce for Communications and Information announce today the [Information Infrastructure Task Force](#) (IITF) Secretariat has begun operating a computer bulletin board system to provide public access to IITF and other National Information Infrastructure (NII) related documents, including IITF schedules, committee reports and minutes of meetings.

"Our goal is to make government information available and easily accessible to the public," stated Larry Irving. "As we move towards our goal of rapidly expanding our national information infrastructure, we want to ensure that the public is kept aware of our activities."

The Information Infrastructure Task Force (IITF) Bulletin Board may be reached through Internet or by calling 202/501-1920 using a personal computer and a telephone modem. The bulletin board is available to the public 24-hours each day, seven days a week.

For access through Internet, point your Gopher client to iitf.doc.gov or telnet to iitf.doc.gov and log in as gopher. Comments may be sent by E-Mail to nii@ntia.doc.gov.

For telephone access, dial 202/501-1920. Modem communication parameters should be set at no parity, 8 data bits and 1 stop bit (N,8,1). The bulletin board modem operates at speeds up to 14,400 baud. If the above number is busy, the same information may be access by dialing 202/482-1199 and choosing the IITF item.

When dialing in for the first time, you will be prompted for your name, location and terminal type. It is recommended you select VT-100 for your terminal type.

After you have logged in, you can choose to read or download information stored under the subject areas below.

- Frequently Asked Questions
- Directory/Points of Contact
- Press Releases
- Schedule/Calendar of Events
- IITF Committee Reports and Minutes
- Documents/Papers
- Selected Legislation

If you have any questions, contact Charlie Franz, Dan Davis or Art Altenburg at 202/482-1835 (E-Mail: cfranz@ntia.doc.gov).

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

State of Texas Recognized for Service, BBS

By [Claudia Lynch](#), *Benchmarks* Editor (as04@unt.edu)

The State of [Texas](#) was one of six state governments honored recently by *CIO* magazine, a national publication for information executives. According to *Tech Times*, the [Department of Information Resources](#) (DIR) Newsletter (Vol.5, No. 5), DIR was listed on the magazine's "honor roll" as one of the top government agencies committed to customer service.

State BBS

In its list of Texas' accomplishments, *CIO* magazine highlighted a [BBS](#) managed by the Comptroller of Public Accounts. "Window on State Government," as the BBS is called, provides on-line data on the state's economy, population statistics, employment forecast, and sales tax reports to Texas citizens.

Accessing the BBS

The Window on the State Government BBS can be accessed by calling 1-800-227-8392. The BBS has twelve phone lines, with four 14.4 and eight 9,600 baud modems. You can find a lot of useful information on this BBS, including a complete index of tax forms, and an up-to-date file on the latest winning lottery numbers, previous winning combinations, and an analysis of frequencies of winning numbers. One of the best features of the BBS is the ability to dial out to other Government BBSs (this is an item on one of the menus). Other BBSs available include the [Texas Parks and Wildlife BBS](#), The Texas Marketplace, run by the [Department of Commerce](#), and the [Texas Cancer Center](#).

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

News From the CWIS/Gopher Hole

By Mark Thacker, CWIS Coordinator (thacker@unt.edu)

This column covers features and resources available through the University's Gopher Campus Wide Information System (CWIS). Gopher is available on various UNT host computers including the VAX, Sol, and Jove. It is also available in the General Access Labs and on various Novell file servers around campus.

Change in Focus

This month, I have decided to finally get back to one of the primary focuses of this column: highlighting new Gopher servers that I have seen in the great vastness of Gopherspace. I foresee that this will probably remain the primary focus of my column for now, with additional highlights of new [UNT Gopher](#)/USENET NEWS information as it is appropriate.

Most of the information about these services comes straight from the source the Gopher administrators. In fact, you can track the progress of Gopher yourself by reading the USENET NEWS group comp.infosystems.gopher.

New Area of Gopher Dedicated To This Column

In the interest of making access to Gopher systems easier, I have set up an area of our Gopher tree that contains pointers to all of the Gophers mentioned in this column. However, I will change these pointers as I write a new column . . . so, you need to plan on placing bookmarks to these services if you find them useful; this way you can return to the servers anytime you like, even if our Gopher server is not up. See your individual Gopher client documentation for more information about bookmarks.

The new area of Gopher is located at:

- [Remote Information & Resources on the Internet](#)
- - [Gophers In This Month's Benchmarks](#)

New Gopher Highlights

Each Gopher featured here is accompanied by the text describing it as posted by the original author

.

- **National Geophysical Data Center** - [The National Geophysical Data Center](#), a division of the [National Oceanic and Atmospheric Administration](#) is pleased to announce that its Gopher server, gopher.ngdc.noaa.gov is open for business. This gopher will contribute Earth and near-Earth scientific data archives to gopherspace, as well as links to other gophers in the scientific, academic and data repository communities. Email comments and questions to gopher@gopher.ngdc.noaa.gov.

Bruce Welker
ISD System Administration
NGDC/NOAA
Mailstop E/GC4
325 Broadway
Boulder, Co 80303
email: bdw@terra.ngdc.noaa.gov
audio: 303-497-7079
fax: 303-497-6513
Discl: Whatever I say is a personal opinion, unsupported by any authority or fact.

- **SchoolNet Gopher** - [SchoolNet](#) is a joint Federal/Provincial initiative of the [Canadian Government](#). Our gopher has been designed specifically for the needs of students and educators (K-12).

Please check it out and put it up. Our gopher address is

ernest.ccs.carleton.ca.419

If you have any comments or suggestions please drop me a line schoolnet-admin@ccs.carleton.ca

Thanks!

Chris Lalonde

[FreeNet](#) Science and Engineering Consulting Group

- **National Health Security Plan** - President Clinton's National Health Security Plan is available on line now. The Gopher site I chose has the full text of the plan, searchable indexes to it, and commentary. It appears as *National Health Security Plan*.

Mark Thacker

CWIS Coordinator

- **Council for the Renewal of Undergraduate Education** - We are pleased to announce a new Gopher server

Name=Council for the Renewal of Undergraduate Education

Host=130.235.92.156

Port=70

Path=

Type=1

This Gopher has been experimental since spring 1993. Now we've received a grant from the Swedish Council for the Renewal of Undergraduate Education and the service will be permanent. The Gopher will contain information on the members and projects of the Council.

The main activities of the Council are:

- 1) Distribute money to projects to enhance the quality of undergraduate education
- 2) Teacher exchange program. Next year 100 Swedish professors will spend at least six weeks fulfilling teaching duties at a foreign university. In exchange a professor from that university will teach in Sweden for six weeks.
- 3) Support efforts to recruit women to natural science and civil engineering education

As many of the projects involve computers the Council has started a Network for Computer based Learning. The network is responsible for the new gopher.

The largest part of the gopher will be dedicated to a database with programs for CBL.

Here we will have educational programs, reviews of programs and links to other sources and articles on CBL. We have started with the subjects Medicine and Physics.

!!! This announcement is also a call for material on CBL.!!!

Much of our text material has been in Swedish so far but we aim and have already started to transform into English.

The administrators of the server are

Bengt Kjollerstrom
Dept. of Theoretical Physics
Solvegatan 14A
223 62 Lund
voice: +46-46-109081
facsimile: +46-46-104438
email: bengtk@thep.lu.se
and ...
Hans Svensson
email: hans@thep.lu.se

- **IBM ACIS Higher Education Information Server - IKE** The IBM Kiosk for Education (IKE) is an information service accessible primarily by gopher and also available via telnet, and dial-in. IKE offers many different types of IBM information, application software, and a bulletin board for IBM users in the higher education community. The system is funded by IBM and developed and operated by the University of Washington. There are three basic services offered on this system files for browsing, software to download, and forums where you may share information with other users. The files include: IBM Product Announcements, General IBM News, IBM ACIS Higher Ed News, IBM Hardware and System Software Catalogs, recent product announcements, Instructional Software Descriptions and Reviews, IBM Publications, and Usenet IBM Archives. The software includes instructional programs for higher education and OS/2 IBM Employee-Written Software. Forum (bulletin board) topics include Campus Networking, Telecommunications Technical Exchange, Instructional Computing, Multimedia, discipline topics (Life Sciences, Mathematics, etc.), Distance Learning, as well as technical topics related to IBM product use in higher education. Accessing the system: Gopher users should select IBM ACIS Higher Education Information Server - IKE from their gopher list. If your campus has its own gopher server, IKE may be added to the menu using the following gopher information: Type=1 Name=IBM ACIS Higher Education Information Server - IKE Path= Host=ike.engr.washington.edu Port=70 Telnet users may telnet to 128.95.32.61". The number for dial-in users is (206)543-3761. ike@ike.engr.washington.edu (206)543-5604
- **Space Shuttle/Hubble Press Release Photographs** - I have loaded the press release photos from STS-58, STS-51L, and STS-1 on an anonymous ftp and Gopher server (krakatoa.jsc.nasa.gov) at the [Johnson Space Center](http://www.nasa.gov). I have also included the Hubble telescope deployment photos. Look under /graphics/PressReleases.

Future missions will be posted as soon as the press release sets have been selected, usually about a week after landing.

If there is sufficient interest I will also load images from each mission from Mercury to the present.

We are discussing the possibility of making all NASA manned mission photos available online. Please let me know if you would use this service and what you would do with the images if you had them. I would also like feedback about the quality of our JPEG compressed files.

Enjoy!

Kevin Marsh kmarsh@deneb.jsc.nasa.gov

Disclaimer: This posting does not reflect official policy or official opinions of any kind.

- **United States Government Gophers** - I am posting the following article for Calvin Boyer; please send any comments to him. By the way, anyone who has not seen the rest of Cal's gopher offering is really missing something.

David Walker
Assistant Director, ECS
Office of Academic Computing

[University of California, Irvine](#)

US Government gophers

There are presently 83 selections under our United States Government Gophers/ No doubt some publicly accessible US government and quasi governmental gophers have been overlooked or are new on the scene.

Name=United States GOVERNMENT Gophers

Type=1

Port=7000

Path=1/gopher.welcome/peg/GOPHERS/gov

[Host=peg.cwis.uci.edu](#)

We would welcome link information to update our list. Thanks for interest and assistance. Please send data to

cjboyer@uci.edu

Calvin Boyer
University of California, Irvine
Office of Academic Computing
INTERNET: cjboyer@uci.edu

UNT-Health Science Center Announces New Gopher

By Mark Thacker, CWIS Coordinator (thacker@unt.edu)

The [UNT-Health Science Center at Ft. Worth](#) (formerly TCOM) has announced the availability of their Gopher server for general use. Mike Hryekewicc in Information Technology Services Division is acting as Gopher administrator.

As time permits, we can expect to see information pertaining to the activities of UNT-HSC, important campus events and other news. You can reach the UNT-HSC Gopher at the address of: gopher.hsc.unt.edu, or by choosing the "UNT-Health Science Center, Ft. Worth" menu item from the top level menu of the main UNT Gopher.

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

Updated Electronic Phone Book Available on UNT Gopher

By Mark Thacker, CWIS Coordinator (thacker@unt.edu)

The [electronic phone book](#) available in the [UNT Information & Resources](#) area of the UNT Gopher has been updated to include the latest faculty/staff information. The update includes electronic mail addresses of those faculty/staff wishing to provide it.

The update also allows you to search by phone number (office and home) as well as electronic addresses. Note that with most Gopher clients ([DOS](#), [UNIX](#) and [Windows](#)) the search is an *exact match* only. This means that you might not be able to search for phone numbers containing a certain string. The Mac TurboGopher client and the Windows HGopher client allow you to search (in all valid search fields) for records that *begin* with a certain string (for example "(817)565-").

Phone numbers (both office and home) are now in the (xxx)xxx-xxxx" format. So, all on-campus office phone numbers begin with "(817)565-". This was done so that people using our phone book from off-campus locations on the Internet would also have the area code (someone in Minnesota doesn't necessarily know that UNT is in the 817 area code). Student records have not been updated to this form yet.

I expect to update the phone book again to include the most recent student information early in the Spring 1994 semester. Look for another announcement in *Benchmarks* soon.

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

Dallas Museum of Art Providing Information and Images on UNT Gopher

By Mark Thacker, CWIS Coordinator (thacker@unt.edu)

I am proud to announce that we have our first real "external" information provider for the UNT Gopher system: the [Dallas Museum of Art](#). They have agreed to provide information about current museum events, showings, activities and even selected images from their collection. Kevin Comerford will be providing the information on a weekly basis. Expect the collections of images to change once every one to two weeks.

To view the information in Gopher, follow this path from the root of the UNT Gopher.

- [Denton, Dallas & Ft. Worth Information & Resources](#)
- [Dallas Museum of Art](#) - Information & Images

If you have any questions concerning this Gopher item, please contact me.

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu



Information Resources Council News

Minutes provided by Sue Harrison, Recording Secretary

IRC Regular Voting Members: Ray von Dran, Library and Information Sciences (Chair); Cengiz Capan, College of Business; Carolyn Cunningham, Student Affairs; Paul Dworak, Faculty Senate; Brian Forsman, TCOM Information Resources Council; Chuck Fuller, Fiscal Affairs; Larry Gleeson, School of Visual Arts; Don Grose, Libraries; David Hartman, School of Community Services; Royce Lumpkin, College of Music; Sam Magill, TCOM Director of Information Technology Services; Steve Miller, Administrative Affairs; Tom Newell, Telecommunications (Ex-officio); Don Palermo, Academic Administration; Jean Schaake, College of Arts and Sciences; Juliet Getty, School of Merchandising and Hospitality Management; Paul Schlieve, College of Education; Virginia Wheeless, Associate Vice President and Director, University Planning and Institutional Research. **IRC Ex-officio Nonvoting Members:** Bill Buntain, Computing Center; Jim Curry, Microcomputer Maintenance Shop; Paul Gandel, Computing Center; Richard Harris, Computing Center; Coy Hoggard, Computing Center.

November 16, 1993 Meeting

Attendance

Voting members present: Cengiz Capan, Cathy Cobb (for Steve Miller), Carolyn Cunningham, Paul Dworak (for David Shrader), Chuck Fuller, Kandace Gandel (for Virginia Wheeless), Larry Gleeson, Don Grose, Barbara Hall (for David Hartman), Monica Holmes, Tom Newell (ex-officio), Jean Schaake, Paul Schlieve, Kathy Swigger, Ray von Dran (chair).

Non-voting members present: Bill Buntain (ex-officio), Jim Curry (ex-officio), Paul Gandel (ex-officio), Richard Harris (ex-officio), Coy Hoggard (ex-officio), Sue Harrison (recording Secretary).

IRC Steering Committee

Chairman von Dran reported that he reported three items to the IRC Steering Committee:

1. The addition of two representatives to the IRC, one undergraduate student and one graduate student.
2. The Instructional Technology Subcommittee's recommendation to redirect funds that are intended for renovation of the Auditorium Building.
3. The recommendation of the IRC that there be no restrictions placed on the use of the Internet.

Items 1 and 2 were accepted by the Steering Committee; however, the issue of renovating the Auditorium Building was

returned to the Instructional Technology Committee for reconsideration. Paul Gandel added that Celia Williamson is working with a subcommittee to develop a more detailed justification for the committee's recommendation, as well as more concrete suggestions for alternative uses of the funding.

Discussion followed concerning use of the Internet which included a case of legal action being brought against UTD regarding inappropriate use of the Internet, and a question of whether or not to provide warnings to students about the appropriate use of the service. It was reported that Richard Rafes has taken this issue under advisement and it was agreed that since there are already University policies and procedures in place for handling any situations that may arise, nothing further needs to be done to regulate the use of the Internet at this time. It was suggested that this issue be addressed by the Instructional Technology committee, and that it is insured that basic guidelines are provided so that there is an avenue of recourse provided in the event there is a situation that has to be dealt with. In addition, it was recommended that instructors and lab supervisors be educated as to any guidelines, policies and procedures in existence for handling incidents.

Vision Statement

Kathy Swigger presented the finalized vision statement and reported that the committee had not received any comments or requests for changes to the statement; therefore, the committee decided to keep the title of the statement Vision for the Role of Information Technology rather than change it to Information Resources as had been suggested at the last IRC meeting. A motion to accept the Vision Statement was passed.

General Access Labs

Cengiz Capan reported that the General Access Labs are working very well and experiencing no problems. The committee continues to discuss the changing nature of computing and is trying to keep the labs up-to-date in order to meet the needs of faculty and students. Two GAL policies are under revision at this time; one concerns definition of a continuing student with regard to who should have access to the labs; and the other concerns placing restrictions and limitations on laser printer output. Several methods of monitoring printer output, some of which are already in use in the labs, were discussed. It was reported that there are presently no color printers in the General Access Labs, but students do have access to one in C.I.S.

Strategic Plan

Richard Harris presented a tentative calendar for finalizing the University Strategic Plan which aims at bringing the whole University planning process in sync with the DIR reporting process. He also distributed a proposed timeline which Susan Pierce, Virginia Wheelless, and Cengiz Capan developed. Susan Pierce said it is hoped that the timeline is set forth in a way that spreads the tasks out over the whole year. She asked for feedback from the IRC members and said that the Strategic Planning Committee will meet to iron out the details at its next meeting and she will present the final timeline to the IRC at its December meeting. It was announced that the SPC meetings are open to anyone interested in attending.

E-Mail Task Force

Paul Schlieve reported that the E-Mail Task force would like the IRC to select another committee to deal specifically with the issue of electronic forms because electronic mail alone is such a complicated issue that his task force doesn't have time to deal with electronic forms. It was agreed that the Administrative Program Group would be the appropriate forum for addressing the issue of electronic forms because forms are key to administrative functions. The Chair proceeded by removing electronic forms from the E-Mail Task force's charge and asked that it be taken up by the Administrative Program Group. Regarding E-Mail, Schlieve reported that in spite of the fact that this is an evolving issue, the task force is hopeful that they will decide on a system whereby everyone can communicate with each other. They will not be recommending that there be a single mail package used as a standard for the campus.

Computerized Classrooms

The need for computerized classrooms was discussed and assigned to the Instructional Technology Subcommittee, for further study.

Program Groups

Paul Gandel reported that the Instructional Program Group met and talked about their charge and briefly set goals and objectives. Tom Newell reported that the Communications Program Group met and wished to make several recommendations to the Council as set forth in the committee's report. The Council agreed that Don Grose and Ray von Dran, who serve on the University Planning Council, would see that the Program Group's recommendations were carried to the next UPC meeting. Susan Pierce reported that the Standards and Cooperation Program Group has met and set their regular meeting time as the 2nd and 4th Mondays of each month, 2:00-4:00 pm, Personnel Conference Room, in Marquis Hall. The group has met and reviewed the Information Resources Strategic Plan, Standards and Cooperation goals, objectives, and strategies. They also reviewed several proposals presented by Bill Buntain last May, and believe those proposals will provide a good foundation for addressing some of the issues of their area. One immediate recommendation the group wishes to make is that Property & Inventory Control strongly emphasize assigning individual custodianship to capital inventory, rather than all capital inventory in a department assigned to the department head. A second recommendation is that the purchase order on-line system be expanded to list line items purchased and not just vendor name. Susan also reported that the group is in the process of updating the Supported Computing Items List (SCIL).

Minutes of Program Groups will be distributed to IRC members via E-Mail.

December 14, 1993 Meeting

Policy Requested

The Chair reported that Richard Rafe has asked the IRC to draft a policy, consistent with its recommendation to the IRC Steering Committee, regarding the use of Internet News Service. Rafe will then add the legal terminology to make it a legal policy. Paul Gandel suggested that a simple policy statement could be made, such as This resource should be used in accordance with policies and procedures already in existence at UNT. Ray von Dran reminded the group of questions raised at the last meeting regarding procedure to follow in the case of reports of sexual harassment in the use of this resource in General Access Labs. Gandel reiterated that the policies and procedures for complaints of this nature are already in place and that lab monitors just need to be educated about them. The Chair appointed Paul Gandel, Paul Schlieve and Arne Almquist as a subcommittee to draft a statement for Mr. Rafe. It was agreed that training of lab monitors would be left to the General Access Lab Committee to address.

Steering Committee

Ray von Dran reported that he had presented the IRC Vision Statement to the IRC Steering Committee and it was accepted; the statement was also presented to the University Planning Council. The Steering Committee was also advised of the need for \$200,000 for the campus communication infrastructure, for which there is no immediate visible source of funds available. The \$40,000 needed for enhancement of existing wiring was not denied; however, the Steering Committee would like to have a little more information about what buildings are included. The Committee suggested that a department needing additional wiring and having no funds should alert its vice president about that need.

The Chair asked that the Communications Program Group 1) prepare a detailed report to justify the expenditure of \$40,000, for presentation at the next IRC meeting; and 2) address the issues associated with long-range planning for the wiring needs of the campus.

IRC Planning Timeline

Richard Harris distributed a draft of a timeline for IRC planning for Spring of 1994, explaining that if this timeline is followed, it will afford the IRC Program Groups an opportunity to include their input into the University planning process. There were no objections to following the suggested timeline.

Program Groups

Each of the Program Group Conveners made reports, which indicated they were organizing and beginning to set goals. The Standards & Cooperation Program Group has updated the Supported Computing Items List (SCIL). This list is available either on Gopher or in the Computing Center.

Customer Advantage Program

It was indicated that current plans for implementation of the WordPerfect Customer Advantage Program call for each college to have an assigned software manager who would be responsible for consolidating licensing information for quarterly reports to be submitted to the Support Services Coordinator in the Computing Center. Multiple people within a college could be authorized to download and install the software in the program, but the college would submit a single report. Any requests for modifications to this approach are to be presented to Bill Buntain or to the Standards and Cooperation Program Group.

Instructional Technology Committee

Celia Williamson distributed a report from the Instructional Technology Committee, as well as a recommendation for the use of the Main Auditorium, prepared by Mark Withers, of CIS. Williamson stated that after further review of the issues relating to the renovation of the Main Auditorium, the ITC wishes to stand by its original recommendation to the IRC and submitted these documents in support of that recommendation. A motion was passed to accept the ITC's report and the recommendation of the Chair.

Gopher Demonstration

Mark Thacker, the Campus Wide Information Coordinator, presented a demonstration of Gopher, showing the group how to use it and what information is available on the service. He explained that Gopher is available to anyone with an Ethernet card in their PC, and that an ID is not needed.

Conclusion

Cengiz Capan stated that a proposal from the Computing Center or the IRC needs to be approved so that Bill Buntain can move forward with obtaining PC software site licenses for the whole campus. He urged that something be done quickly. The Chair charged the Standards & Cooperation Program Group to prepare such a proposal and bring it to the next IRC meeting.

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

Staff Activities

Employees Honored

- The **Payroll/Personnel Data Systems Team** was recognized as an outstanding department at the Chancellor's Staff Sack Lunch on November 3. Team members are **John Hooper, Rong Wang, Margaret Ambuel, Meng Long Wong,** and **Lek Thannavibulpol.**
- **Barbara Borgalio**, a programmer on the Fiscal Data Systems Team, received a 5 year service award in October.
- **Dan Strange**, a programmer/analyst on the Fiscal Data Systems Team, also received a 5 year service award in October.

Publications and Presentations

- **Eriq Neale**, General Access Lab Manager, had a book review published in the Fall 1993 volume of *Library Software Review*. The *Visual Guide to Visual Basic* by Richard Mansfield was reviewed on page 76 of the periodical.

Eriq's much awaited musical offering, "Sacrificing Toasters to Alien Poets", is now available on tape. If you are interested in purchasing a copy of this *Green Chili Burp and the Aftertaste* tape at a very reasonable price, contact Eriq (neale@unt.edu, 565-4808).

- **Dr. Paul Gandel**, Senior Director of Academic Computing, presented a paper at the ACM SIGUCCS Conference in San Diego, CA (Nov. 7-10). The paper, "Providing User Services with Cross-Organizational Cooperation," was co-authored with **Bill Buntain**, Director of Network and Microcomputer Services (this was reported erroneously in our last issue).

Dr. Gandel along with Dr. Ray von Dran, Dean of the School of Library and Information Sciences, gave a poster session on A Federated Approach to Information Resource Management at the CAUSE conference December 7-10. The theme of this year's conference was Managing Information Technology as a Catalyst of Change. It was held in San Diego, CA

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

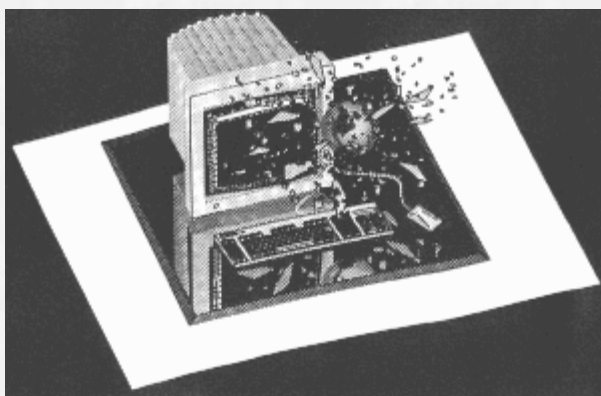
On the Road to the Information Superhighway

By [Claudia Lynch](#), *Benchmarks* Editor (lynch@unt.edu)

You've heard the term, you've groaned at the puns, but what exactly is the Information Superhighway? Good question.

For all intents and purposes, at this point in time, the Information Superhighway and the Internet are synonymous. The Information Superhighway is a marketing term that was coined to promote the High Performance Computing Act of 1990, authored by then-Senator Al Gore.

Using the highway analogy, you might think of the Internet as I-35, and various other computer networks and services as access roads and feeder highways. As the popular weekend newspaper insert *USA Weekend* ([\[usaweekend@aol.com\]](mailto:usaweekend@aol.com) January 21-23, 1994, p. 4) put it:



On the information road map, such commercial online companies as Prodigy, CompuServe and America Online are analogous to private toll roads, offering users a preset array of information services for a monthly fee. Some online services offer on ramps to the Internet, an immense world-wide web of computer networks that is more like an interstate highway with exits to international destinations.

Metamorphosis

When *USA Weekend* does a story on something, you know it has arrived in the mainstream. When things become mainstream they usually metamorphose for better and/or worse from what they were before they were discovered. This is especially true of the Internet.

The scholars and researchers who once considered the Internet their personal domain have been joined by bikers and businessmen, kindergartners and nursing home residents. This has caused some cultural clashes that have been interesting, upsetting, amusing, and enlightening, sometimes all at once.

What is the Internet changing into?

The Internet is becoming whatever it will be like when there really is an Information Superhighway.

What will it be like?

Laws passed and technologies invented and embraced today will determine what the Information Superhighway will be like in the future. It's all up to us.



Indications of the Future

The article on the right offers some indications of the way things seem to be heading technologically, politically, and socially. Perhaps this will shed some light on what the future holds for the travelers on the Information Superhighway.



[Table of Contents](#)

[Next Article](#)

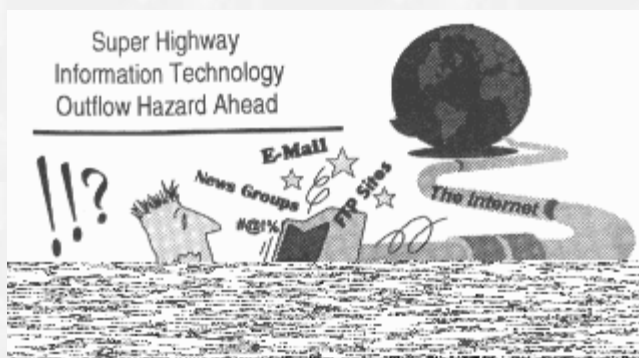
If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

What Does the Future Hold for the Internet?

By [Claudia Lynch](#), Benchmarks Editor (lynch@unt.edu)

No one knows what the future holds, but sometimes you can make an educated guess. By taking a sample of items reported in [Edupage](#) (edupage@ivory.educom.edu), a twice-weekly summary of news items on information technology, between February and July of 1994 we can get an idea of the way things are going. Below are the results of this non-scientific sampling, arranged in broad categories. Some of the entries are not related to the Internet, per se, but give an indication of technological changes that may affect the way the Internet is used in years to come.

I'll leave it to you to draw your own conclusions. Let me know if you have any predictions you want to share with our readers.



Growth, Access and Distribution Methods

- **Internet Statistics: The Net Keeps Growing and Growing** Traffic on the NSF backbone growing by a stunning 20.7 percent nearly 2 terabytes during the month of March the largest single jump in the history of the Internet. Gopher traffic grew by 17.6 percent and http (WWW) grew by 32.0 percent to a new total of one-half terabyte per month. Http traffic grew by a total of 0.7 percent of total NSFNet traffic. (Internet Society, reported in [Edupage](#) 4/28/94)
- **Burgeoning Bulletin Boards** According to Boardwatch, a magazine that follows BBS issues, the number of electronic bulletin boards has doubled in the past 18 months to 60,000 nationwide. More than 12 million Americans call into a BBS every day. (Investor's Business Daily 2/17/94 p. 4, reported in [Edupage](#) 2/17/94)
- **Population Boom in Cyberspace** By the end of this year, nearly four million U.S. households will have signed on with one of the Big Three online services [America Online](#), [CompuServe](#) or Prodigy. (Investor's Business Daily 6/9/94 C17, reported in [Edupage](#) 6/9/94)
- **FCC Divides Up Airwaves** The FCC today will begin the process of carving a niche in the spectrum for personal communications services. Citing industry estimates, Chairman Reed Hundt predicts in a decade approximately 100 million Americans will be paying about \$40 a month for PCs and other wireless services, as opposed to the \$60-65 that 17 million now pay for cellular service. The most controversial issue involved in the PCs auctioning process is whether there should be a set-aside for small businesses and minorities. (New York Times 6/9/94 C1, reported in [Edupage](#) 6/9/94)
- **NTIA Will Fund Information Highway** The head of the National Telecommunications and Information Administration says its budget will go primarily toward jump-starting the creation of an information highway. \$100 million of a \$134 million budget request will go to grant

programs to help state and local governments, schools, libraries, and health care and public safety providers to undertake the planning needed to ensure effective development of the telecommunications infrastructure. (BNA Daily Report for Executives 4/15/94 A32, reported in Edupage 4/19/94)

- **Small Change on the Net** Researchers at [Carnegie Mellon University](#) are developing NetBill, a computerized system for tracking and billing users for small transactions, such as a ten-cent charge per document. The developers hope NetBill will evolve into a universal accounting system on the Internet. (Chronicle of Higher Education 4/20/94 A31, reported in Edupage 4/19/94)
- **Smart Housing** A consortium plans to link a community of 300 new smart homes and university residences in Newmarket to services ranging from home shopping to health care in a \$50-million field trial of multi-media technology set to be operational by August 1995. Members of the Intercom Ontario consortium include York University, University of Toronto, the Government of Ontario, IBM Canada and Apple Canada (Toronto Star 4/19/94 D1, reported in Edupage 4/19/94)
- **High-Speed Data to the Home** [AT&T](#) launches a new high-speed data service designed for use in the home. The company's Digital Long Distance Service will allow customers to make local and long-distance calls, as well as send full-motion color video, fax and data files over a single telephone line. (Tampa Tribune 4/27/94, reported in Edupage 4/28/94)
- **McCaw & Gates Plan Satellite Network** Two high-tech entrepreneurs are planning a \$9 billion wireless global Internet, using low earth orbit satellites to provide a wide array of wireless interactive voice, data and video services. Craig McCaw, McCaw Cellular Communications, and Bill Gates, [Microsoft](#), envision a system that employs 840 refrigerator-sized satellites operating the 30/20 Ghz Ka-band to connect handheld phones and other electronic devices to tele-phone networks around the world. As currently planned, the Teledesic Corp. project is more than 10 times the size of [Motorola's](#) low earth orbit Iridium project. (Wall Street Journal 3/21/94 A3, reported in Edupage 3/22/94)
- **GLOBALNET to Link Cities** GLOBALNET has chosen Orlando, Fla. as a prototype city in its project to link 300 metropolitan areas nationwide. The \$3-million project will connect city agencies to each other and to the Internet. (St. Petersburg Times 3/28/94 p. 8, reported in Edupage 3/29/94)
- **Fiber Optic to Africa** AT&T; hopes to use a \$1-1.5 billion grid of undersea fiber optic cables for communications among African countries and between Africa and the rest of the world. African nations need to be connected to the global marketplace, says an AT&T; executive. The network would be owned and managed by Africans. (New York Times 4/26/94 C4, reported in Edupage 4/19/94)
- **IBM's China-bound** IBM will work with China to provide a range of information technology ventures, including designing and installing several regional communications networks as well as a backbone linking them into a national system, establishing a software development center, and opening three networking sales and service centers. (Wall Street Journal 5/4/94 B5, reported in Edupage 5/5/94)
- **Access Canada** The Canadian federal government blueprint for a new national utility called Access Canada to spur development of the info-highway would create a national web of networks linking every home, business, school and government office; the blueprint focuses initially on making the government a model-user of new technologies. (Toronto Globe & Mail 4/25/94 B3, reported in Edupage 4/19/ 94)
- **Compasses for Network Navigation** There's an opportunity to make the Internet vastly more usable for business people. And that's what's going on now, says the vice president of WAIS (Wide Area Information Server). Software developers are flooding the market with tools for navigating the arcane labyrinth of Internet databases, and it's only going to get better. Even Microsoft will include an Internet-made-easy communications connection in its next major upgrade of Windows. (Investor's Business Daily 5/6/94 A3, reported in Edupage 5/8/94)
- **Interactive TV for Kids** A new company called DaVinci Time and Space will develop interactive TV services in which kids will be able to play games, watch videos, learn, or

communicate with other kids who have similar access to interactive cable systems. (New York Times 3/29/94, reported in Edupage 3/22/94)

- **The Power of Positive Thinking** Brain-activated technology maps a person's brainwaves and uses the information to control physical objects, such as moving cursors on a computer screen, steering a wheelchair, and maybe even flying an airplane. (Discover 5/94 p. 58, reported in Edupage 4/19/94)

What's Online?

- **Europe Online** A group of European media, banking and publishing companies are launching Europe Online, an information service network that will offer interactive services initially in French, German and English. (Wall Street Journal 6/3/94 B4, reported in Edupage 6/ 5/94)
- **Electronic Newsstand** To use the Internet as a way to take a look at Educom Review, The New Yorker, The New Republic, and many other national magazines, connect through Gopher internet.com or telnet internet.com and login as enews. The print version of the latest Educom Review is now in the mail to our subscribers (Edupage 2/17/94)
- **Electronic Filing** More than 14 million tax returns will be filed electronically this year, according to IRS estimates. (Wall Street Journal 2/16/94 A1, reported in Edupage 2/17/94)
- **Reuters Targets Info Highway** Reuters is aggressively positioning itself to be a major contributor of the information that will travel the information superhighway. Over the past year the news service has acquired all or parts of 25 companies in an effort to solidify its role in providing the high-margin intellectual content that the electronic pipelines of the future will carry and that traders, investors and executives will pay to receive. (Business Week 2/21/94 p. 46, reported in Edupage 2/17/94)
- **Groceries Online** Winn-Dixie supermarkets in Atlanta will soon be offering online computerized ordering services through America Online for a \$9.95 delivery fee. (Atlanta Journal-Constitution 2/17/94 K1, reported in Edupage 2/17/94)
- **Telemedicine Expands in Georgia** The Georgia Statewide Academic and Medicine System, a two-way interactive TV system connecting doctors with patients at remote sites, will link at least 50 health care facilities by year's end. (Atlanta Journal-Constitution 6/17/94 B8, reported in Edupage 6/19/94)
- **Digital Cinema** Pacific Bell's Cinema of the Future will begin transmitting movies electronically to about a dozen movie theaters in Los Angeles this summer. The new process involves converting the film into digital format, zapping it along fiber-optic lines to a video server, which doctors it up for feeding into high-definition film projectors in the local theater. (Wall Street Journal 3/21/94 B10, reported in Edupage 3/22/94)
- **Vanderbilt Puts TV Broadcast Abstracts on the Net** Vanderbilt University has gone ahead with a controversial plan to make abstracts of television news broadcasts available on the Internet. Broadcasters have worried that the university eventually may post actual footage to its archive. The Television News Archive can be accessed by pointing your Gopher at: tvnews.vanderbilt.edu. (Chronicle of Higher Education 6/8/94 A16, reported in Edupage 6/9/94)
- **Coming Soon Newscasts on Your PC** Intel and CNN have teamed up to test LAN TV, a system that turns a regular broadcast TV signal into a compressed digital data stream, capable of being received on regular 486-type desktop PCs. While Intel tests the technology, CNN will concentrate on determining what it is people want to watch on their computers, in order to develop a special corporate news service. (Investor's Business Daily 6/20/94 A4, reported in Edupage 6/21/94)
- **TV Chat** America Online and Capital Cities/ABC will offer AOL subscribers the opportunity to tap into an online newswire, a celebrity chat, and interactive games from ABC Sports. ABC is the last of the Big Four broadcasters to wade into Cyberspace. (Wall Street Journal 7/7/94 B5, reported in Edupage 7/7/94)
- **Computer Banking Statistic** Half of all the banking transactions at New York's Chemical

Bank are now done on cash machines, the telephone or with personal computers. (Atlanta Journal-Constitution 5/29/94 R9, reported in Edupage 5/29/94)

- **Electronic Government Benefits** The federal government will start delivering public assistance benefits electronically over the next five years, and a nationwide system will replace welfare checks and food stamps by 1999. Following a pilot program in Maryland that reduced welfare fraud by 47% in the first year, it's expected that the new system will net \$195 million a year in savings. (Wall Street Journal 6.1.94 A8, reported in Edupage 5/29/94)
- **Click and Win a Burger** NBC and McDonald's are planning a promotional tie-in campaign this Fall which may include electronic couponing and click and win consumer components on America Online. (Advertising Age 5/23/94, reported in Edupage 6/2/94)

The Legal Arena

- **Gimme Five ... And Get Your Hand Scanned for Customs** Kiosks set up by the Immigration and Naturalization Service at JFK and Newark Airports allow you to zip through customs using an electronic hand reader to verify who you are. You can sign up to get your palm read and entered in the INS PASS system if you make at least three international flights into those airports per year. (Business Week 5.2.94 p. 132, reported in Edupage 4/28/94)
- **E-Mail Messages Released** The University of Michigan has released copies of messages exchanged during a computer conference of the school's regents. The action was in response to requests from two newspapers, which claimed that messages passed among publicly elected officials are public information. (Chronicle of Higher Education 4/27/94 A26, reported in Edupage 4/28/94)
- **Electronic Copyright Grievance Filed** A writer who conducted an interview with Fidel Castro in 1967 for Playboy has filed a grievance with the National Writers Union against the magazine, accusing it of electronic piracy, after the interview was transferred to CD-ROM. Playboy had sent the author a check for \$100, which he deemed inadequate. (Wall Street Journal 4/27/94 B9, reported in Edupage 4/28/94)
- **Online Copyright Guidelines** A White House committee has released a report recommending a series of refinements in current copyright laws with regard to electronic transfer of information. Among the recommendations are revising fair use rules to include digital and online works, and making it a crime to import, manufacture or distribute devices designed to defeat anti-copying systems. (Washington Post 7/7/94 D9, reported in Edupage 7/8/94)
- **Archaeologist Wins Internet Defamation Suit** An archaeologist, formerly at the University of Western Australia, has won a lawsuit filed in Australia against an anthropologist, claiming comments made about him on an Internet bulletin board were defamatory. Damages equal to \$28,000 were awarded after a psychiatrist testified to the plaintiff's anxiety and depression suffering caused by the remarks. (Chronicle of Higher Education 4/27/94 A26, reported in Edupage 4/28/94)
- **Ads (and Flames) on the Net** After sending an unsolicited ad for his legal services to more than 9,000 Internet Usenet groups, a Phoenix lawyer got 30,000 replies, including thousands of flames [outraged messages] from persons who objected to his use of the Internet for unsolicited direct mail. Internet Direct, the lawyer's service provider, rescinded the lawyer's account. The lawyer's threatening a \$250,000 lawsuit against Internet Direct and is planning to write a book about advertising on the Internet. (New York Times 4/19/94 C1, reported in Edupage 4/19/94)
- **Hacker-Proof** Dallas Semiconductor Corp. has developed a microchip that it says will foil even the best computer hackers trying to break into corporate files. The chip, about the size of a dime, works the same way as a hotel security card or ATM card does, and an employee could not log on without it. (Investor's Business Daily, reported in Edupage 2/17/94)
- **Privacy Warning** Ontario's Information and Privacy Commissioner warned that the information highway needs regulation to protect user privacy. In his recommendations, the Commissioner said legislative rules must address ethical questions of monitoring E-mail by

- 
- employers and urged the development of security systems to prevent third parties from intercepting communications. (Ottawa Citizen 2/16/94 p. D6, reported in Edupage 2/17/94)
- **Privacy Facing Extinction?** Warning that Canada's Blueprint for the Delivery of Government Services could be the harbinger of an end to the privacy of personal information, columnist Gordon Grant contends that as government departments broaden the scope of information they share, the inability to ensure it doesn't fall into the wrong hands increases proportionately. (Ottawa Sun 3/28/94 p. 12, reported in Edupage 3/29/ 94)
 - **E-mail Eavesdropping** One in five companies admits that it eavesdrops on its employees by searching computer files, voice mail or E-mail, but a spate of lawsuits is beginning to curb the habit. If a company plans on monitoring employees, it should tell them in advance to avoid legal trouble later. (Investor's Business Daily 4/19/94 A4, reported in Edupage 4/19/94)
 - **Crime-Fighting on the Net** Alert subscribers to online services geared toward collectibles rare books, baseball cards, stamps and coins have foiled a number of attempts to sell stolen items, and services specifically designed for fighting crime are forming. The Jeweler's Security Alliance will begin transmitting digital wanted posters of known jewel thieves through a privately run computer network. (Wall Street Journal 6/2/94 B2, reported in Edupage 6/ 2/94)
 - **Cybercop** A former New Jersey police officer now spends his time crusing for suspects in cyberspace and has been involved in dozens of criminal investigations, including a sting operation that nabbed a pedophile who lured young rape victims via a bulletin board service. (Tampa Tribune 6/8/94 BayLife 5, reported in Edupage 6/9/94)
 - **Man Wanted on the Internet** When the Okaloosa County (FL) Sheriff's Office put a man wanted posting on the alt.internet. services and alt.culture.internet newsgroups, responses ranged from criticism of the posting to these particular newsgroups, to praise of the Sheriff's Office for yet another novel use of the Internet, to suggestions for creation of new newsgroups (alt.wanted, alt.unsigned-mysteries ...). (Edupage 6/28/94)
 - **Cyberporn is Prosecuted** In two recent cases in Oklahoma and Texas, courts have convicted defendants for using electronic bulletin boards to distribute obscene material. In the Oklahoma case, defense attorneys argued that state obscenity laws don't apply to electronic devices such as CD-ROMs, claiming that what was on the disks was actually binary code. In the Texas case, U.S. Secret Service agents seized computers and electronic equipment from an electronic publisher. (Wall Street Journal 5/27/94 B3, reported in Edupage 5/29/ 94)
 - **Man Charged in Electronic Stalking** A Michigan man has been charged with breaking a state anti-stalking law for continuing to send E-mail to a woman after she and the police told him to stop. If convicted, he could be jailed for one year or fined \$1,000. (St. Petersburg Times 5/27/94, reported in Edupage 5/29/94)
 - **Cruel and Unusual Punishment** A prison inmate who uses his time to file frivolous product liability lawsuits has had his computer taken away by the judge. The Legal Aid Society says the judge's sanctions are too harsh, although the prisoner will still be able to continue to handwrite his complaints against numerous companies, none of which (surprisingly?) are a computer hardware or software vendor. (New York Times 3/29/94, reported in Edupage 3/29/94)

The Work Arena

- **Brains Over Muscle** 1991 was the first year in which companies spent more on computing and communications gear than on industrial, mining, farm and construction machines. And today, a typical new automobile has \$675 worth of steel and \$782 worth of microelectronics. (Fortune 4/4/94 p. 25, reported in Edupage 3/22/94)
- **Telecommuting** In 1990, there were an estimated 2 million telecommuters in this country. That number has increased to 7.8 million this year. And by the year 2001, there will be an estimated 30 million telecommuters. (NBC Nightly News 3/22/94, reported in Edupage 3/22/94)
- **Software Replaces Sportswriters** A \$100 software program called Sportswriter is capable of

churning out reasonably good sports copy by intelligently stringing together words between facts. Some 80 small newspapers in the Midwest have purchased the program and are using it to cover high school sports events. (Wall Street Journal 3/29/94 A1, reported in Edupage 3/29/94)

The Downside

- **Access to What?** In the ongoing discussions over equal access to the information superhighway, it's often overlooked that transmission is only one component of that access, the others being computer hardware and software. Government officials have yet to suggest that Compaq offer a 'lifeline' computer for, say, \$1 a month, or that Microsoft be required to give away Word for Windows. (Telecommunications Policy Review 4/29/94 p. 10, reported in Edupage 5/5/94)
- **E-Mail Bottlenecks** Overstuffed mailboxes and oversized files are two of the biggest offenders in slowing E-mail to a snail-mail pace, according to Ferris Networks, a San Francisco-based E-mail research firm. Although the problem will be somewhat alleviated when ATM technology is fully implemented, the proliferation of more and bigger files will continue. Ferris' president anticipates an average post-compression message to be 100 kilobytes in size by 1998, up from 10K currently, with volume rising to 60 messages a day, up from 20-40 now. (Investor's Business Daily 4/18/94 A4, reported in Edupage 4/19/94)
- **Network Benefits, Network Risks** Increasingly sophisticated networks will eventually have the whole country plugged into a single grid. Communications professor A.M. Noll at the University of Southern California warns that with the benefits of such a grid will come a risk that some software glitch could transmit an erroneous signal or traffic indication that would collapse the entire network, bringing telecommunications to a total halt in this country. (Forbes 4/25/94 p. 142, reported in Edupage 3/29/94)
- **Tranquility Hard to Find in Electronic Age** I was just skiing in Vail, and they were offering cellular phones and pagers to use on the ski lift, says an astonished observer. Tranquility and solitude are getting harder to find in the electronic age, but one professor of communications is philosophical: These devices provide an opportunity for overworking, not a mandate. Workaholics have existed forever, with or without machines. (New York Times 4/25/94 B4, reported in Edupage 4/19/94)
- **Downside to Telework** With five Canadian government departments experimenting with telework to shift jobs away from the office using information technology, unions representing public servants warn that it may result in longer working days without additional compensation. (Toronto Star 4/25/94 E1, reported in Edupage 4/19/94)
- **Will Internet be Paradise Lost?** Author James Fallows predicts that as the Internet expands, something will have to give; either the government will stop paying, or politicians will notice that the government is paying and will impose controls, like those imposed by school boards on textbook content or by the FCC on radio and TV broadcasts. The Internet's low visibility era of subsidized innocence will end, and the network will become as complicated as anything else. (Atlantic Monthly July 94 p. 34, reported in Edupage 6/21/94)

Miscellaneous

- **NII Report Released** A report outlining the benefits and obstacles to using the information superhighway was released last week and the Commerce Department is requesting comments on the findings. Putting the Information Infrastructure to Work predicts the new data highway will improve the competitiveness of the U.S. manufacturing base; speed the efficiency of electronic commerce and business-to-business communications; improve health care delivery and help contain medical costs; promote access to the educational system; and enable government to dispense services to the public faster, more responsively and more efficiently. To order copies, call (202) 783-3238 and request NIST Special Publication 857. (BNA Daily

Report for Executives 5/5/94 A10, reported in Edupage 5/8/94)

- **Trolling in Public Databases** The government routinely scours its 4,000 databases looking for welfare cheats, draft dodgers, tax cheats, etc. The Clinton Administration's proposed Health Security Card, a smart card with personal information on individuals, would create a huge new government database with medical records on every citizen. (Investor's Business Daily 6/2/94 A1, reported in Edupage 6/2/94)
- **E-Mail at the White House** Both the Bush and Clinton administrations have tried to restrict public access to White House E-mail, but later this year the National Security Agency will publish White House E-Mail, a book-length collection of E-mail messages. The book includes Iran-Contra affair communications to and from Oliver North, who used E-mail because he thought it could be easily deleted. One message from him reads: Oh lord. I lost the slip and broke one of the high heels. Forgive please. Will return the wig on Monday. (New York Magazine, 6/6/94 p. 20, reported in Edupage 6/5/94)
- **PC With TV, Phone, Radio, FAX** Packard Bell will be offering personal computers that can double as radios, TVs, telephones and FAX machines. Priced at \$1,000 \$3,000, the systems will use Intel's 486 and Pentium microprocessors and will come with stereo speakers; Most will also have CD-ROM drives and include 27 software titles. The systems will have removable plastic panels that allow a consumer to make a fashion statement by adding splashes of colors such as teal or azure. This is like adding a tie to a suit, says a company executive. (New York Times 6/14/94, reported in Edupage 6/14/94)
- **Thoughts for All (or at Least 700) Occasions** Computerized form letters have been written on 700 subjects to respond to mail sent to the Senate Labor and Human Resources Committee. There are robo compassion letters for people in declining health and a robo poetry letter thanking people who send in poetry. The letters are signed by an automatic pen. (Atlanta Journal-Constitution 3/29/94 A 14, reported in Edupage 3/29/94)
- **Revising Family History** DivorceX offers to expunge all traces of your ex-spouse in the family photo albums, using a popular software called Photostop. The proprietor scans the photo, erases the unwanted party's image, and reprints the picture all for \$100-200 a pop. What if you get back together? No problem, He'll reinsert it by the same process. (Wall Street Journal 6/16/94 B1, reported in Edupage 6/16/94)
- **Auctions in the Electronic Marketplace** It was just a matter of time... public auctions have now become dial-up affairs, with a computer-generated voice replacing the rhythmic patter of the auctioneer. The Automated Bidding System is built around four 486 PCs and specialized software. Bidders call in on an 800 number, and the automated system doles out updated information while registering bids and tracking the process. It even calls a customer back if he overbids by mistake. (Investor's Business Daily 5/4/94 A4, reported in Edupage 5/5/94)
- **For Computer Illiterates Only** There's now a service for executives who receive E-mail but can't deal with computers. A New Jersey-based telephone company automatically faxes E-mail messages to subscribers, allowing them to read their mail the old-fashioned way on paper. (St. Petersburg Times 5/8/94 A8, reported in Edupage 5/8/94)
- **Snail Mail an Endangered Species?** Canada's postal corporation is making preparations to join the info-highway. Its chair predicts that stamped mail likely will become extinct as electronic information replaces regular mail, delivering services by TV, telephone and computer. (Toronto Globe & Mail 6/3/94 B3, reported in Edupage 6/5/94)

[Previous Article](#)



[Next Article](#)

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

The Ghost in the Modem

For Architects of the Info-Highway, Some Lessons From the Concrete Interstate

By Richard Sclove (resclove@amherst.edu) and Jeffrey Scheuer

In keeping with the theme of this issue, we offer you the following article as food for thought. This article is one in an occasional series of E-mail postings on democratic politics of science and technology, issued by The Loka Institute, and is reprinted with their permission. Section headers were added here by the editor.

*This article was written by Loka Institute members, and is reprinted from the Outlook Section of **The Washington Post**, Sunday, May 29, 1994. Richard Sclove is executive director of the Loka Institute in Amherst, Mass., a public interest research organization concerned with science, technology and democracy. He also directs the Public Interest Technology Policy Project at the Institute for Policy Studies. Jeffrey Scheuer, a New York writer, is a fellow of the Loka Institute, P.O. Box 355, Amherst, MA 01004-0355*

Vice President Gore envisions the information superhighway as the second coming of the interstate highway system championed by his father, former U.S. Senator Al Gore, a generation ago. Let us hope that the junior Gore is proven wrong. Rush-hour traffic jams, gridlock, garish plastic-and-neon strips, high fatality rates, air pollution, global warming, depletion of world oil reserves have we forgotten all of the interstate highway system's most familiar consequences?

It's not that Gore's analogy is wrong, only that his enthusiasm is misplaced. Comparing the electronic and asphalt highways is useful but mostly as a cautionary tale. Building the new information infrastructure will not entail the degree of immediate, physical disruption caused by the interstate highway system. But sweeping geographic relocations, and accompanying social transformations, seem probable. And the risk of inequity in contriving and distributing electronic services or, conversely, imposing them where they are not wanted is clear.

Social Repercussions

Indeed, disparities in access to new information systems have already begun to surface. A study released this past week by a group of public interest organizations, including the National Association for the Advancement of Colored People and the Center for Media Education, notes that low-income and minority communities are underrepresented in U.S. telephone companies' initial plans for installing advanced communications networks.

Unequal access is only the most obvious among many social repercussions that may lie in store for us. The real history of the interstate highway system suggests how we can think about and control the vast implications of new technologies and a new national public infrastructure.

It is widely assumed that Americans' infatuation with cars led to the construction of America's superhighways. But actually when Congress passed the Interstate Highway Act in 1956, car sales were slack, and there was no popular clamor for building a new road system. At the time only about half of American families owned an automobile; everyone else depended on public transportation. Congress was responding to aggressive lobbying by auto makers and road builders, plus realtors who saw profits in developing suburban subdivisions.

The Act's key provisions included support for bringing freeways directly into city centers and earmarking gasoline tax revenues for highway construction. As the interstate highways were built, city and suburban development adapted to the quickening proliferation of autos. Soon more Americans found themselves forced to buy a car in order to be able to shop or hold a job. The Highway Trust Fund, by assuring the rapid atrophy of competing public transit systems, bolstered this trend.

Thus the asphalt highways and the society around them are a reflection of successful lobbying by powerful business interests and external compulsion, not simply the free choices of consumers. There is no guarantee that the process of wiring consumers and employees into the electronic highway system will be different.

The effects of the interstate highway system on American communities were profound, especially in the cities. As historian James Flink notes, Ambitious programs for building urban freeways resulted in the massive destruction of once viable poor and minority neighborhoods. In other cases, new highways encircled poor neighborhoods, physically segregating minorities into marginalized ghettos.

Gradually, a black and Hispanic middle-class did emerge. Its members too fled along the interstate to the suburbs, further draining economic and cultural resources from the inner city. This contributed to the emergence of a new social phenomenon: today's desperately deprived, urban underclass.

Elsewhere the effects were subtler but still significant. The noise and danger from growing numbers of autos drove children's games out of the street, and neighbors and families off their front porches. Before long, suburbs without sidewalks came to signal an unprecedented paucity of local destinations worth walking to. Suburban housewives found themselves leading increasingly isolated daytime lives at home.

Highways made shopping malls possible, enabling franchise and chain store sales to boom. But this sapped downtown centers.

For some teenagers and senior citizens, today's anonymous, consumption-mad expanses provide a semblance of community space having swallowed up the general store, the soda fountain, the Main Street sidewalk, and the town square. There is ample danger of the new electronic technology extending these losses.

Remember too that it is easy to romanticize new technology. The popular arts glorified life on the highway. People read Jack Kerouac's *On the Road*, watched Route 66 on television, and recall the Merry Pranksters' psychedelic bus-capades during the '60s. In fusing alienation and rebellion with youthful exuberance, each of these foreshadows contemporary cyberpunk culture. Yet real-life experience on the interstate is mostly banal and uneventful. McDonald's, Pizza Hut, and Wal-Mart look about the same wherever you exit.

Political Ramifications

There are also political ramifications of a vast new public infrastructure. Interstate highways contributed to national and even international economic integration. But while GNP soared, mom-and-pop production and retailing declined. That meant greater local dependence on national and global market forces and on distant corporate headquarters powers that communities simply couldn't control. The locus of effective political intervention thus shifted toward more distant power centers. But because those are realms in which everyday citizens cannot be as effectual as in smaller political settings, democracy was impaired.

If the growth of the highways is revealing, so too is the opposition to freeway construction that

emerged. As citizens became more politically mobilized during the 1960's and early '70s, opposition to relentless highway expansion arose from environmentalists and from local communities, both rich and poor.

Transportation engineers reeled at the specter of upright citizens rejecting their good works. Many current telecommunications engineers and true-believing entrepreneurs are no less convinced of the unalloyed beneficence of their art.

The importance of the analogy between the information and asphalt highways lies in the political procedures that create them. What if a wider range of people, including non-car owners, had been involved in transportation planning all along? Considering the alternatives envisioned by critics such as Lewis Mumford, it seems likely we would have a smaller and different road system today. As in Europe and Japan, there probably would have been greater investment in public transit. Modern America might exhibit less sprawl, less dependence on foreign oil, and more cohesive urban neighborhoods.

Three Lessons

Three lessons for the construction of the information superhighway suggest themselves:

1. **No Innovation Without Evaluation:** To help reduce adverse social impact, the federal government should mandate evaluated social trials of alternative electronic services. Analogous to environmental impact statements, these trials should precede full-scale deployment of any major components of new information infrastructures.
2. **No Innovation Without Regulation:** We should conserve cultural space for face-to-face social engagement, traditional forms of community life, off-screen leisure activities and time spent in nature. How about a modest tax on electronic home shopping and consumer services, rebating the revenue to support compensatory, local community-building initiatives?
3. **No Innovation Without Participation:** A number of European nations are out-competing America in including lay people in technology decision-making. For instance, the Danish government appoints panels of everyday citizens to cross-examine a range of experts, deliberate among themselves and then publish their own social assessments of technological alternatives. Sweden, Norway and Germany have pioneered processes for involving workers directly in designing new production systems.

Conclusion

The coming revolution in information systems is going to change life for everyone including the multitude who, by circumstance or choice, never use computers. It is imperative to develop mechanisms for involving all segments of our society in designing, evaluating and governing these new systems.

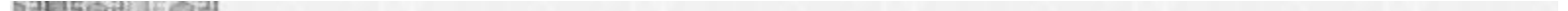
Data highway enthusiasts may see such measures as wasteful obstructions of market forces. But what entrepreneurs call red tape is really democracy in action.

[Previous Article](#)



[Next Article](#)

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu



Another Way to Cruise the Internet

By Eriq Oliver Neale (neale@unt.edu)

I like to think of myself as being up to date with the latest technologies and communications infrastructures. I have a high-end Macintosh on my desktop, I have an Ethernet connection to the internet world, I've got modem connections to other places in the world, I've got lots and lots of files occupying lots and lots of disk space, well, I think you get the idea. I've really been taking this whole information superhighway thing for granted, because I'm so well-connected here in my office. Admittedly, there are times that I forget that not everyone has the type of connectivity that I do. So, sometimes I get lax about investigating new toys that I come across. Well, this one came back to bite me.

About a year ago, I first heard about the Web. The term didn't carry much significance for me, and I was fine with what I had access to, so I ignored it. But time and time again, I kept hearing the term used. I began to hear more and more people talk about it. So I finally decided to investigate for myself. What I found was a communications mechanism far beyond what I thought it could have been, not to mention one that can be rather confusing at first.

What it is

The Web is really just another way to access information on the Internet. There is not a separate communications network that is dedicated to the Web, instead the Web provides a different mechanism for accessing sites that are on the Net. If you're already familiar with Internet services such as Gopher and FTP, you already know about those parts of the Web.

Web versus Gopher

Let's take a moment and compare the Web to Gopherspace. Mark Thacker has written many articles about Gopher in previous issues of Benchmarks and other publications. With Gopher, you run a client on your computer that connects to a Gopher server on another computer, and the information stored on the server is displayed to you through the client software. The Web operates identically: you run a client (usually called a Web browser) on your computer which connects to a Web server to display information.

So what is the difference between Gopher and the Web? Gopher is essentially a text-retrieval system. Sure, it can be used to download files of all types to a local disk, but it can only interactively display text items. These items are presented in a menu-like hierarchy for selection. Because of the textual nature of Gopher, there are clients for just about every type of computer imaginable, including a dumb terminal. No special graphics capabilities are needed to access the information contained within a Gopher system. Gopher systems can generally connect only to other Gopher servers. There are a few Gopher to WAIS and other gateways, but Gopher works best when talking to its own kind.

News from the CWIS/Gopher Hole, a column by Mark Thacker, is a regular feature of Benchmarks. [This issue's column is found on page 22.](#) Two recent articles by Mark that might be of particular interest to readers of this issue appeared in the May/June 1994 Benchmarks on pages 19 and 21.

Web browsers are more visually-oriented. As such, the most prominent Web clients are heavily graphic, although there are a few character-based clients being used. Not only will a Web client display textual information, it will also display certain types of images inside the client, and some clients will handle some forms of audio directly as well. Information items are presented in a free-form hypertext metaphor instead of a structured list or menu (though a Web site could set its

information up in this way). But possibly the most important functional difference between Web and Gopher clients is that Web clients can access many other systems directly, such as FTP and Gopher. So it is possible to use a Web client to access a Gopher site in very much the same way as a Gopher client would access the site.

Which system is better? That's a question that cannot be answered. There are pluses and minuses to both systems, but the system to use is the one that will afford you best access to the information you wish to retrieve.

What it Does

Without getting into too much technical detail, let's look into how information is delivered to a Web client. We'll begin by looking at how the information is prepared on a Web server and end with a brief overview of some of the Web clients that are currently available.

HTML and Web Pages

The metaphor used by Web clients and servers to disseminate information is that of a page. When your client connects to a server, a Web page is displayed. While each page may look completely different, each one is formatted to follow an exacting specification. This format is called HTML.

HTML is an acronym for HyperText Markup Language, and it is the language that each Web client speaks. When your client connects to a Web server, it downloads an HTML file. The codes in that file specify what the client is to display on the screen. The HTML file includes information about which GIF images should be displayed (if any), the style and appearance of any text, and links to other Web information sites.

Without going into detail, let me illustrate how a page might be formatted. In this example, I'll borrow liberally from my own home page (see the address in my byline). I've created an HTML file which contains information about myself and where I work (and the kind of work I should be doing), a few images of myself and campus, and many links to other pages. Some of these links are to other local HTML files (such as my Texas Rangers Baseball Schedule or project list), and some are to pages that exist on other servers (such as the Dinosaur Exhibit at the University of Hawaii <http://www.hcc.hawaii.edu/dmos/dmos.1.html>, the Web guide to Nasa http://hypatia.gsfc.nasa.gov/NASA_homepage.html, and Dr. Fun <http://sunsite.unc.edu/Dave/drfun.html>). The person viewing my page doesn't have to know where all these resources are. He or she will simply click on the indicated link area of the page and be transported to the other site automagically. Really, it's not magic, but it sure seems like it sometimes.

Finding Sites with a Web Browser

How does the client software know where to get the information indicated in a link? And how does it know what type of information it is accessing? Each link contains a formatted address which indicates not only the type of link, but also specifically where that link exists. If you've been reading a number of mailing lists or newsgroups recently, you've probably seen something like this within a message or signature: <http://lipsmac.acs.unt.edu/Rangers/schedule.html>

This is a Web address that indicates the location of my Texas Rangers Web page. Let's break the address down and see what's really being said.

The http: tells the client to make a hypertext transfer protocol connection. Other types of connections would be ftp: and gopher:. The client will treat each connection type differently because it's accessing a different set of services.

The //lipsmac.acs.unt.edu tells the client the address of the computer where the server software is running. This is a standard Internet address that would be used in making an FTP connection or a Gopher connection.

The /Rangers/schedule.html tells the client which file on the server to display. With Web clients, the extension on a filename is important. html tells the client that the file is an HTML-formatted file. Other extensions have different meanings (.gif indicates a GIF file, .au indicates an audio file, etc.).

Most Web clients have options where the location of the page being viewed can be displayed on the screen along with the page. Some people like to see this information, others may get confused by it.

Let's see another example. Suppose my client found the link
ftp://ftp.unt.edu/pub/antivirus/mac/gatekeeper-127.hqx It would make an anonymous FTP connection to ftp.unt.edu and download the file named gatekeeper-127.hqx from the /pub/antivirus/mac directory. Makes sense now, right? Right. Me neither.

Multiple Server Sites

So is it possible for an Internet site to run more than one server simultaneously? Absolutely. At one point I had an FTP server, a Gopher server, and a Web server running on my Mac at the same time. I quit doing that for a number of reasons, most importantly being that I was running out of memory! But it is possible to see several different types of links to the same address. One might see a link ftp://mimas.acs.unt.edu/ or gopher://mimas.acs.unt.edu/ in a page. While these links go to the same machine, there may be reasons to access the information differently.

Web Clients

Being the Mac-head that I've become, I'm most familiar with the two Web clients that I've used on that platform. They are NCSA Mosaic 2.00 and MacWeb 0.98. Both are built around the Mac GUI and function fairly well in that environment. There are still some problems with both clients, but they are very usable for Web browsing. On the PC, there is WinMosaic from NCSA for Windows, and Lynx for DOS. I'm only marginally familiar with WinMosaic, and I've only seen Lynx once. On the UNIX side of things, you have XMosaic from NCSA and Lynx again. The article below lists some sources for these clients.

What it Means to You

I've found in the few weeks that I've been experimenting with Web software that it really is an easy access method to information out in the world. While the number of FTP and Gopher sites is still very large, the number of Web sites are increasing rapidly. Especially when you have people like me putting up their own pages for whatever ego strokes they may receive as a result. But as non-technoids begin to hook up to the superhighway, Web servers and clients are going to make it an easy transition for them. Plus, commercial services like America Online have plans to add Web functionality to their services. Soon, we'll all be travelling at light speed on this information web being weaved daily.

[Previous Article](#)



[Next Article](#)

If you have problems or questions about this server, please contact us as soon as possible. You can



send mail to the following address: www@unt.edu

Best O' The Net

This article is taken from a GNN press release dated June 1, 1994. For more information and art work for GNN and the twelve winning services contact: Ron Pernick, Niehaus Ryan Haller Public Relations, Inc. (415) 615-7891 ron@nrh.com

[Global Network Navigator \(GNN\)](#) a leading Internet-based publisher and online service, recognized twelve of the best destinations on the Internet in an Editor's choice award at Internet World in San Jose, California, June 1, 1994. Recognized for their contribution to the Internet were services including The Paleontology Server, an interactive natural history museum; the Internet Underground Music Archive, a service which promotes obscure and unavailable bands; and the U.S. Census Information Server, the self-proclaimed Factfinder for the Nation. Also presented by GNN's editors was the First Citizen of the Net award, which went to noted author and online visionary, Howard Rheingold, for his efforts in identifying the democratic role of online communities.

"The Best of the Net awards represent the diversity and character of the Internet, explains Dale Dougherty, GNN publisher. These awards represent the coming of age of the Internet, and is our way of recognizing some of the most fascinating destinations on the info highway."

Below is a complete list of the information services awarded by GNN:

- **ArtServe** (<http://rubens.anu.edu.au/>) Artserve is an arts history database consisting of 2,800 images of prints largely from the 15th century to the end of the 19th century. It was developed by Professor Michael Greenhalgh at Australian National University.
- **The Currency Converter** (<http://www.ora.com/cgi-bin/ora/currency>) The currency converter, developed by David Koblas, automatically converts currency from one denomination to another. It is an excellent example of how information can be presented interactively.
- **Edupage Newsletter** (<http://www.ee.surrey.ac.uk/edupage/edupage/>) The Edupage newsletter is published three times a week via E-mail, Gopher and the World Wide Web. It summarizes printed news coverage of interest to leaders and citizens of the Internet.
- **The Paleontology Server** (<http://ucmp1.berkeley.edu/welcome.html>) The University of California Museum of Paleontology server is an interactive natural history museum that is well organized and makes use of large graphics. You can learn about phylogeny, the Tree of Life, or examine photographs of Great White Sharks off the California coast.
- **International Teletimes** (http://www.wimsey.com/teletimes.root/teletimes_home_page.html) According to its writer's guidelines, this general interest magazine seeks to present informed opinion and observation drawn from the experience of living in a particular place. Editor-in-Chief Ian Wojtowicz is sixteen years old.
- **Internet Underground Music Archive** (<http://sunsite.unc.edu/ianc/>) Developed by UC Santa Cruz students Robert Lord and Jeff Patterson, the Internet Underground Music Archive intends to apply the principles of free software to music distribution. Going beyond the limits of what's defined as commercially viable, the Archive seeks to promote obscure and unavailable bands.
- **New Zealand Information** (<http://www.cs.cmu.edu:8001/Web/People/mjw/NZ/MainPage.html>) Located at Carnegie Mellon, this server provides access to a wealth of information about New Zealand including climate forecasts, speeches in the native Maori language and descriptions of the most ancient of all living reptiles, the Tutarā.
- **Science Fiction Resource Guide** (<ftp://gandalf.rutgers.edu/pub/sfl/sf-resource.guide.html>) This guide organizes access to science fiction-based books, movies, television, awards, trivia, conventions and more. With the help of this resource you can discover the nominees and winners of the Hugo awards, explore Star Trek trivia and more.

- **Taxing Times** (<http://www.scubed.com:800I/tax/tax.html>) Presented as a public service by Maxwell Labs, Taxing Times is a repository of tax forms including many IRS publications online. On April 14 there were 10,300 document accesses from 1100+ hosts.
- **US Census Information Server** (<http://www.census.gov/>) This self-proclaimed Factfinder for the Nation, the Census Bureau's server organizes information such as financial data on state and local governments and schools, poverty in the U.S., and housing changes.
- **Hypertexted USENET FAQs** (<http://www.cis.ohio-state.edu/hypertext/faq/usenet/FAQ-list.html>) Organized by Thomas Pine of Ohio State University, this server makes the answers to frequently asked questions (FAQs) about the Internet easy for online users to find.
- **Xerox PARC Map Viewer** (<http://pubweb.parc.xerox.com/map>) MapViewer is a fully interactive application that dynamically renders a map based on user input. It allows people to access geographic and demographic information such as population, exact location and region name.

About GNN

Global Network Navigator provides direct links to more than 650 information servers on the Internet. Introduced in October 1993, its subscriber base has expanded to over 30,000 registered users. In an average week, GNN is accessed 150,000 times. As part of its service, GNN offers up-to-date news, online forums, the industry's most complete Internet directory, online advertising, and topic-centric information centers.

Global Network Navigator is a free service, and is available to anyone with full connections to the global Internet system who has downloaded Mosaic software for Mac, Windows or UNIX Workstations.

GNN is a product of [O'Reilly & Associates, Inc.](#), a leading publisher of books for UNIX, X, and the Internet, including the best-selling The Whole Internet User's Guide and Catalog by Ed Krol. O'Reilly & Associates, based in Sebastopol, CA and SPRY, Inc. of Seattle, WA will introduce Internet in a Box this summer this shrink-wrapped package will make accessing GNN and the World Wide Web (WWW) easier for a whole new audience of users.

GNN's URL address is <http://gnn.com>. Those with E-mail can receive information and registration forms to GNN by sending E-mail to info@gnn.com.

Information is also available by phone at 1-800-338-6887.

[Previous Article](#)



[Next Article](#)

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

Drop of BITNET Connection Likely

By Dr. Philip Baczewski, Assistant Director, Academic Computing Services, and BITNET INFOREP (ac12@unt.edu)

It appears likely that UNT will cease to be an active member of the BITNET network as of August 31, 1994. On April 17, 1994, [Rice University](#) stopped acting as a core BITNET node. Since Rice served as the sole connection point for the BITNET network in the state of Texas, this change caused many schools to reevaluate their BITNET membership. Most of the UT system left BITNET in April as well.

Through the courtesy of the University of Texas at Arlington, we have been able to continue BITNET services beyond the April date of Rice's departure as the primary connection point. Since most BITNET LISTSERV services are now available via Internet mail, and because BITNET's parent organization, CREN is slow to take steps to modernize the network, there are fewer and fewer reasons to maintain the membership.

If UNT ceases to be an active member of the BITNET network, only services which rely on interactive messages (sent via the CMS TELL command) will no longer be available. Most mailing list subscriptions will not be affected and LISTSERV services will still be accessible via a mail message. We have already taken steps to convert LISTSERV subscription addresses to the Internet format for the nodename for CMS (vm.acs.unt.edu) or the VAX (vaxb.acs.unt.edu).

Your Internet Address

It is important to now begin using your Internet address when exchanging addresses with colleagues around the country or world.

- Your Internet address on CMS is: userid@vm.acs.unt.edu
- Your Internet address on the VAX is: userid@vaxb.acs.unt.edu

Userid is your CMS or VAX User-ID. If you use either system for E-mail, you should supply people with the Internet form of your address. If you have any questions or comments about UNT's BITNET connection, please contact me (ISB 119, 565-2324).

[Previous Article](#)



[Next Article](#)

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

The City of Denton, TWU and UNT

Creating a Civic Information System

By Mark Thacker, CWIS Coordinator (thacker@unt.edu)

Many of you probably read about the City of Denton and how it was providing access to the Internet for the Citizens of Denton in recent articles in the Denton Record Chronicle. While accurate in spirit, those articles were not quite accurate in fact. This article gives you an overview of what the City of Denton, TWU and UNT have planned and how it will affect you.

Background

The City of Denton, [Texas Woman's University](#) and the University of North Texas have joined together in a project to create a [civic information system](#). While the idea of such a project had been thought about in each organization, it wasn't until a concerned citizen, Mike Cochran, stepped forward and offered to be a catalyst for such a project that all of the parties came together. The purpose of such a project is to meld the unique talents and capabilities of each organization and produce an electronic delivery system for civic and community information. This system will provide timely information in a fashion that citizens will be able to access at their homes, businesses and community centers around Denton. *So what is this project?*

The project was initially conceived as a Gopher server utilizing existing UNT/TWU equipment. The City felt that providing information to citizens via dial-up lines to a Gopher server would be a quick and cost efficient method of disseminating information. It will serve as the initial foundation for what we envision as the wired community. Academic Computing Services at UNT agreed to support the City of Denton by making City information available electronically on our existing Gopher server. TWU agreed that it would provide pointers to the City of Denton site from their Gopher. The City, of course, will provide the information.

Current Status

Currently, the City of Denton and UNT provide a basic Gopher accessible information system with City agencies' meeting notes and agendas. This system is designed to be expandable with additional information being added on a daily basis.

Access to electronic community information is provided two ways. The first is via a dial-up modem. Currently there is one single public dial-in line for accessing Denton information electronically. As demand increases, the City plans to add additional lines. Citizens and students do not need an account or any sort of password to access City information through this dial-in line. However, they do need a personal computer, modem and a communications program (Procomm, Kermit, etc.). The City of Denton's electronic information can also be accessed through the Internet. People already having Internet access or accounts on machines connected to the Internet, or who are at the UNT/TWU campus can access the system through any Gopher client for basically any machine (Macintosh, MS-DOS, MS-Windows, UNIX, and VAX).

Type of Information Provided

What type of information will be provided in such a system? Any items that are public record and of public interest are candidates. For example:



- City Council meeting notes and agendas
- Planning Council meeting notes and agendas
- Public utility billing rates and information
- Phone book information for City departments
- Zoning rules and regulations
- Community organization information and schedules
- Tax and land use information
- Feedback/Suggestion box capabilities for Citizens

And, as capabilities grow, additional multimedia items can be provided such as:

- Still pictures and graphics of Denton buildings sights
- Interactive maps with zooming and hot-spot capability
- Movie snippets and sound clips of Denton events
- Movie tours and sample images from museums and University exhibits

While this list is not exhaustive, it illustrates the potential of an electronic village.

The Future

To expand the scope and capabilities of our electronic community information initiatives, the City of Denton, UNT, and TWU recently put in a proposal for a grant from the Telecommunications and Information Infrastructure Assistance Program. This grant will provide for additional funds for expanding this project. Included in this proposal are funds for expansion of community dial-in access, increasing the capacity of our Internet connections, additional equipment, and training.

Regardless of whether we are successful in obtaining this grant, the City, TWU, and UNT are all committed to working together to make Denton a model community for the new electronic information age. As new developments happen, expect additional articles to appear here in *Benchmarks*. If you have suggestions or questions, please contact me.

[Previous Article](#)



[Next Article](#)

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

Hobbes' Internet Timeline v1.3

By Robert Hobbes Zakon (hobbes@hobbes.mitre.org)

1956

- USSR launches Sputnik, first artificial earth satellite. In response, US forms the Advanced Research Projects Agency (ARPA) within the Department of Defense (DoD) to establish US lead in science and technology applicable to the military (:amk:)
-

1962

- Paul Baran, RAND: On Distributed Communications Networks Packet-switching networks; no single outage point

1967

- ACM Symposium on Operating Principles Plan presented for a packet-switching network

1968

- Network presentation to the Advanced Research Projects Agency (ARPA)

1969

- ARPANET commissioned by DOD for research into networking.
- First node at UCLA [Network Measurements Center - Xerox DSS 7:SEX] and soon after at: [legend = function - system:os] Stanford Research Institute (SRI) [NIC - SDS940/Genie] UCSB [Culler-Fried Interactive Mathematics - IBM 360/75:OS/MVT] U of Utah [Graphics (hidden line removal) - DEC PDP-10:Tenex]
- Use of Information Message Processors (IMP) [Honeywell 516 mini computer with 12K of memory] developed by Bolt Beranek and Newman, Inc. (BBN)
- First Request for Comment (RFC): Host Software by Steve Crocker

1970

- LOHAnet developed by Norman Abrahamson, U of Hawaii (:sk2:)
- ARPANET hosts start using Network Control Protocol (NCP).

1971

- 15 nodes (23 hosts): UCLA, SRI, UCSB, U of Utah, BBN, MIT, RAND, SDC, Harvard, Lincoln Lab, Stanford, UIU(C), CWRU, CMU, NASA/Ames

1972

- International Conference on Computer Communications with demonstration of ARPANET between 40 machines organized by Bob Kahn.



InterNetworking Working Group (INWG) created to address need for establishing agreed upon protocols. Chairman: Vinton Cerf.

- Ray Tomlinson of BBN invents E-mail program to send messages across a distributed network. (:amk:)

1973

- First international connections to the ARPANET: England and Norway
- Bob Metcalfe's Harvard PhD Thesis outlines idea for Ethernet (:amk:)

1974

- Vint Cerf and Bob Kahn publish A Protocol for Packet Network Internetworking which specified in detail the design of a Transmission Control Program (TCP). (:amk:)
- BBN opens Telenet, commercial version of ARPANET (:sk2:)

1975

- Operational management of Internet transferred to DCA (now DISA)
- Jargon File, by Raphael Finkel at SAIL, first released (:esr:)
- 1970s Store and Forward Networks Used electronic mail technology and extended it to conferencing
- HM Elizabeth, Queen of the United Kingdom, sends out an E-mail message (anyone know the exact year?)

1976

- UUCP (Unix-to-Unix CoPy) developed at AT&T; Bell Labs and distributed with UNIX one year later.

1977

- THEORYNET created at U of Wisconsin providing electronic mail to over 100 researchers in computer science (using UUCP).

1979

- Meeting between U of Wisconsin, DARPA, NSF, and computer scientists from many universities to establish a Computer Science Department research computer network.
- USENET established using UUCP between Duke and UNC by Tom Truscott and Steve Bellovin.

1981

- BITNET, the Because Its Time NETwork. Started as a cooperative network at the City University of New York. Provides electronic mail and LISTSERV servers to distribute information. Unlike USENET, where client software is needed, electronic mail is the only tool necessary. CSNET (Computer Science NETwork) built by UCAR and BBN through seed money granted by NSF to provide networking services (specially E-mail) to university scientists with no access to ARPANET.
- CSNET later becomes known as the Computer and Science Network. (:amk:) Minitel (Teletel)

is deployed across France by French Telecom.

1982

- INWG establishes the Transmission Control Protocol (TCP) and Internet Protocol (IP), as the protocol suite, commonly known as TCP/IP, for ARPANET. This leads to one of the first definitions of an internet as a connected set of networks, specifically those using TCP/IP, and Internet as connected TCP/IP internets.
- DoD declares TCP/IP suite to be standard for DoD (:vgc:)
- EUnet (European UNIX Network) is created by EUUG to provide E-mail and USENET services. (:glg:)

1983

- Name server developed at U of Wisconsin, no longer requiring users to know the exact path to other systems.
- Cutover from NCP to TCP/IP (1 January)
- CSNET / ARPANET gateway put in place
- ARPANET split into ARPANET and MILNET; the latter became integrated with the Defense Data Network created the previous year
- Desktop workstations come into being, many with Berkeley UNIX which includes IP networking software.
- Need switches from having a single, large time sharing computer connected to Internet per site, to connection of an entire local network. Berkeley releases 4.2BSD incorporating TCP/IP (:mpc:)
- Need switches from having a single, large time sharing computer connected to Internet per site, to connection of an entire local network. Berkeley releases 4.2BSD incorporating TCP/IP (:mpc:)
- EARN (European Academic and Research Network) established. Very similar to the way BITNET works.
- FidoNet developed by Tom Jennings

1984

- Domain Name Server (DNS) introduced. # of hosts breaks 1,000
- JUNET (Japan Unix Network) established using UUCP.
- JANET (Joint Academic Network) established in the UK using the Coloured Book protocols.

1986

- NSFNET created (backbone speed of 56Kbps)
- NSF establishes 5 super-computing centers to provide high-computing power for all (JVNC@Princeton, PSC@ Pittsburgh, SDSC@UCSD, NCSA@UIUC, Theory Center @Cornell).
- ARPANET bureaucracy keeps it from being used to interconnect centers and NSFNET comes into being with the aid of NASA and DOE. This allows an explosion of connections, especially from universities.
- Cleveland Freenet (start of NPTN) comes on-line (:sk2:)
- Network News Transfer Protocol (NNTP) designed to enhance USENET News performance over TCP/IP.
- Mail Exchanger (MX) records developed by Craig Partridge allowing non-IP network hosts to

have domain addresses.

1987

- NSF signs a cooperative agreement to manage the NSFNET backbone with Merit Network, Inc. (IBM and MCI involvement was through an agreement with Merit). Merit, IBM, and MCI later founded ANS.
- UUNET is founded with Usenix funds to provide commercial UUCP and USENET access.
- 1000th RFC: Request For Comments reference guide
- # of hosts breaks 10,000 # of BITNET hosts breaks 1,000
- 1988 Internet worm burrows through the Net

1989

- # of hosts breaks 100,000
- NSFNET backbone upgraded to T1 (1.544Mbps)
- RIPE (Reseaux IP Europeens) formed (by European service providers) to ensure the necessary administrative and technical coordination to allow the operation of the pan-European IP Network. (:glg:)
- First relay between a commercial electronic mail carrier (Compu-serve) and the Internet through Ohio State University (:jg1:)

1990

- ARPANET ceases to exist
- Second relay between a commercial electronic mail carrier (MCI Mail) and the Internet through the Corporation for the National Research Initiative (CNRI)
- Electronic Frontier Foundation is founded by Mitch Kapor

1991

- Commercial Internet eXchange (CIX) Association, Inc. formed by General Atomics (CERFnet), Performance Systems International, Inc. (PSInet), and UUNET Technologies, Inc. (AlterNet) (:glg:)
- WAIS released by Thinking Machines Corporation
- Gopher released by University of Minnesota
- US High Performance Computing Act (Gore 1) establishes the National Research and Education Network (NREN)

1992

- World Wide Web released by CERN # of hosts breaks 1,000,000
- Internet Society is chartered
- NSFNET backbone upgraded to T3 (44.736Mbps)
- First MBONE audio multicast (March) and video multicast (November)

1993

- InterNIC created by NSF to provide specific Internet services: (:sc1:)directory and database services (AT&T;) registration services (Network Solutions Inc.) information services (General Atomics/CERFnet)
- US White House comes on-line: President Bill Clinton: president@whitehouse.gov Vice-

President Al Gore: vice-president@whitehouse.gov First Lady Hillary Clinton: root@whitehouse.gov (-:rhz:-)

- Internet Talk Radio begins broadcasting (:sk2:)
- United Nations and World Bank come on-line (:vgc:)
- US National Information Infrastructure Act Businesses and media really take notice of the Internet
- Mosaic takes the Internet by storm; WWW proliferates at a 341,634% annual growth rate of service traffic. Gopher's growth is 997%.

1994

- Communities begin to be wired up directly to the Internet
- US Senate and House provide information servers
- First flower shop taking orders via the Internet
- Shopping malls arrive on the Internet
- Mass marketing finds its way to the Internet with mass E-mailings
- Worms of a new kind find their way around the Net - WWW Worms (W4), joined by Spiders, Wanderers, Crawlers, and Snakes ...
- A Day in the Life of the Internet begs to be published (:rhz:)

About the Timeline

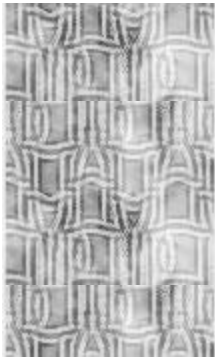
Comments/corrections should be sent to hobbes@hobbes.mitre.org. Hobbes' Internet Timeline Copyright (c)1993-4 by Robert H Zakon. Permission is granted for use of this document in whole or in part for non commercial purposes as long as appropriate credit is given to the author/ maintainer. For commercial uses, please contact the author first. Hobbes' Internet Timeline was compiled from a number of sources, with some of the stand-outs being:

- Cerf, Vinton (as told to Bernard Aboba). How the Internet Came to Be. This article appears in The Online User's Encyclopedia, by Bernard Aboba. Addison-Wesley, 1993.
- Hardy, Henry. The History of the Net. Master's Thesis, School of Communications, Grand Valley State University. <ftp://umcc.umich.edu/pub/users/seraphim/doc/nethist#.txt>
- Hauben, Ronda and Michael. The Netizens and the Wonderful World of the Net. Kulikowski, Stan II. A Timeline of Network History.
- Quarterman, John. The Matrix: Computer Networks and Conferencing Systems Worldwide. Bedford, MA: Digital Press.
- 1990 Internet growth summary compiled from: Zone program reports maintained by Mark Lottor at: <ftp://ftp.nw.com/pub/zone> Connectivity table maintained by Larry Landweber at: ftp://ftp.cs.wisc.edu/connectivity_table
- USENET growth summary compiled from Quarterman and Hauben sources above

Contributors to Hobbes' Internet Timeline have their initials next to the contributed items in the form (:zzz:) and are: amk - Alex McKenzie (mckenzie@bbn.com) esr - Eric S. Raymond (esr@locke.ccil.org) glg - Gail L. Grant (grant@pa.dec.com) jg1 - Jim Gaynor (gaynor@agvax.ag.ohio.state.edu) mpc - Mellisa P. Chase (pc@mitre.org) sc1 - Susan Calcari (susanc@is.internic.net) sk2 - Stan Kulikowski (stankuli@uwf.bitnet) - see sources section vgc - Vinton Cerf (vcerf@isoc.org) - see sources section

Help the Author

The author is on an eternal genealogical search. If you know of someone whose last name is Zakon or could spare 1 minute to check your local phone book, please e-mail any info (i.e., name, phone, address, city) to rhz@po.cwru.edu; your help is greatly appreciated.



[Previous Article](#)



[Next Article](#)

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

The Network Connection

By Dr. Philip Baczewski, Assistant Director, Academic Computing Services, and BITNET INFOREP (ac12@unt.edu). This column is a continuing feature of *Benchmarks* intended to present news and information on various aspects of wide area networks.



How Secure is Your Internet Mail?

Over the past years, much news and attention has been devoted to Internet security. A couple of specific examples are the problems with hackers gaining unauthorized access to systems, as depicted in Clifford Stoll's *The Cuckoo's Egg*, (Stoll, Clifford, *The Cuckoo's Egg*, Doubleday, New York, 1989) and the very much publicized Internet worm incident that temporarily shut down many Internet-connected computers in 1988. (Hafner, Katie and John Markoff, *Cyberpunks, Outlaws and Hackers on the Computer Frontier*, Simon and Schuster, New York, 1991.) A bigger issue of Internet security exists on a smaller scale. If you don't know already, Internet mail is not, by default, secure. It is not necessarily insecure, but since it is transmitted in clear text and may pass through two or more machines before being delivered, the chance does exist that it could be inadvertently or intentionally copied or intercepted along the way.

There are several existing and upcoming solutions to making Internet E-mail more secure. A new Internet standard called Privacy Enhanced Mail (PEM) proposes a structure for transmitting and authenticating secure E-mail. An existing public-domain program named PGP (Pretty Good Privacy) written by Philip Zimmerman implements a solution similar to that specified in the PEM standard. Both implement the Rivest-Shamir-Adleman (RSA) public key system of cryptography. By applying an advanced level of cryptography to mail and files sent over the Internet, it is possible to ensure a reasonable degree of security.

Complex Issues

The issues surrounding RSA security are diverse and sometimes complex. However, the technical issues are not as confusing sometimes as the political ones. The U.S. Federal government has imposed export restrictions on certain types of encryption technologies. RSA security is included in these restrictions, and when a copy of PGP was posted on an anonymous FTP server that was openly accessible by those outside of the U.S. and Canada, certain agencies of the U.S. government were quick to begin pointing fingers, ultimately resulting in some difficulties for Philip Zimmerman. Today, the distribution of PGP is somewhat controlled and restricted to use in the U.S. by U.S. citizens or residents. In spite of these complications, however, PGP remains a quite useful program.

If you are familiar with computer programs that perform encryption, you know that when you want to make information secure, you usually do so by providing a key word or phrase which is used as the basis for calculating the encrypted information values. To reverse the process and decode the information, you have to provide the same key as was used for the encryption. As long as you are the only person who knows the key, then your information will be reasonably secure; however, once you wish to transmit information to someone else in a secure fashion, a single-key encryption method becomes problematic. Finding a secure way to transmit that key can be difficult or impossible, especially if you want to do so automatically and electronically. RSA security uses a concept called dual key encryption. It is implemented with both a public key and a private key, terms which you are likely to hear more and more often as this scheme is integrated into messaging applications. The RSA algorithm uses a scheme in which information encoded with one key can only be decoded with



the other. In other words, if a file is encrypted using the public key then it can only be decoded using the corresponding private key. The reverse is also true. In practical terms, public/private key encryption lets you digitally sign a document using your private key (in your possession only), and encrypt a document intended for someone else using their public key (acquired directly from that person or from an authenticated representative). Other people can send you information encrypted using your public key that only you can decode using your private key.

PGP

PGP is one program that implements RSA security for the purposes of encoding electronic mail. PGP is not the only program available, but an intriguing aspect of it is that the author has placed it in the public domain. If previous programs are any indication (Kermit, for example), PGP could become a de facto standard for Internet mail security. Both PGP and the PEM standard do not actually use the RSA algorithm to encrypt an entire message. Instead, they employ a standard single-key encryption method (Data Encryption Standard or DES) with a randomly generated key, and then encrypt that single key using RSA. This method provides the authentication and security features of RSA, but with the speed of a single-key algorithm.

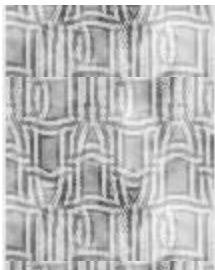
PGP performs a number of functions in support of E-mail security management. It will allow you to generate a key pair: a private key for signing your mail, and a public key which you can distribute to others as their verification of your signature. It will maintain a key ring where you can store your and other's public keys. Most importantly, it will encrypt and sign files and allow you to generate them in two formats: a binary file for local access (i.e. encrypted for local security purposes only or for transfer by binary FTP), or an ascii-encoded version that can be sent across the Internet via E-mail.

PGP is available in versions for MS-DOS, Macintosh, and UNIX. It can be obtained via Anonymous FTP from net-dist.mit.edu, in the directory, /pub/PGP (the Massachusetts Institute of Technology serves as the official distribution point for PGP). You must first acquire the README file in that directory which will provide you instructions on the procedure for acquiring PGP from that site. Because of the restrictions on the distribution of PGP, you will actually need to telnet to the MIT machine and verify your status within the U.S. and agree to abide by the export and licensing restrictions. Because you want your security program to be secure from tampering, it's best to get it from the most reputable source possible. The distribution process at MIT provides some controls on distribution, but more importantly to you, also assures you of a reputable source.

Further Information

More information about RSA security in general and about the PGP program can be found in the PGP documentation, which provides some excellent background material on some of the cryptography issues as well as some history of the PGP program. The file names are PGPDOC1.TXT and PGPDOC2.TXT and are distributed with the program. Another way to learn about PGP, RSA security, and the PEM standard is to read the USENET news groups [alt.security.pgp](#), [alt.security.ripem](#), [info.pem-dev](#), and [sci.crypt](#).

It's likely that the next generation of E-mail programs will include security as a feature. A proposal to integrate PEM or PGP within the MIME standard is also in the works. With the increasing expansion of the Internet, and the advent of more commercial communication via electronic means, the ability to authenticate electronic communication becomes more and more important. Awareness of these issues now will make it easier to take full advantage of the Internet in the coming years.



[Previous Article](#)



[Next Article](#)

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

List of the Month

Each month we will highlight one BITNET, Internet, or USENET Special Interest Group (SIG) mailing list. This month's list...

GRANTS-L on LISTSERV@GSUVM1.GSU.EDU

Grants and Funding for International Education and Research

Owner: James F. Pettus ibcjfp@gsusgi2.gsu.edu

GRANTS-L is an initiative of the Regents' Global Center of the [University System of Georgia](#), and serves to promote external funding for international education and research. The LISTSERV is intended to provide a forum for sharing experience, ideas, thoughts, comments and sources of information on the preparation and administration of contracts and grants.

Specific topics include, but are not limited to: proposal writing and editing; federal/state laws and regulations; campus policies and procedures; animal care and use; misconduct in science; procurement integrity; consulting; cost sharing; publication rights; budget development; direct and indirect costs; grant/contract administration; client relations; Internet resources; electronic editing and software; and so on.

To subscribe, send the following command in the BODY of mail to LISTSERV@GSUVM1.GSU.EDU:

sub grants-l YourFirstName YourLastName

[Previous Article](#)



[Next Article](#)

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

FAQs Available Via E-Mail

Three FAQs produced by Kevin Savetz (savetz@rahul.net) are now available via electronic mail. Just put any of the following boldface commands in the subject line of your message to receive an FAQ on the desired topic.

- **send is-faq** to receive the Internet Services FAQ.
- **send booklist** to receive the Unofficial Internet Book List.
- **send fax-faq** to receive the Faxing from the Internet FAQ.
- **subscribe is-faq** or **booklist** or **fax-faq** to receive periodic updates to the info. of your choice.

[Previous Article](#)



[Next Article](#)

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

New Internet Book Available

By Cynthia Koepp, *Benchmarks* Assistant Editor (koepp@cc1.unt.edu)

Now available for checkout at the ISB library: Directory of Directories on the Internet: A Guide to Information Sources by Gregory B. Newby, published by Meckler. The author describes it as:

a book to help you to identify some of the guideposts on the Internet and the relations among different resources. It is aimed at all Internet users, old and new. For newer networkers, this book offers an overview of what's out there, and a way to focus in on some of the discussion forums and information services most likely to meet their needs. For a more experienced networker, this book is a reference tool for finding those resources that the user can remember seeing somewhere, but can't remember where .

If you have ever rooted around your work area for a particular scrap and scribble (Where is that info about the Rick Gates' Internet Hunt?), you probably can relate to Newby's last comment!

This book discusses such diverse Internet topics as Gopher, WorldWideWeb (WWW) and Netiquette, but it's a much slimmer volume than The Whole Internet (which Newby mentions in the chapter covering books about the Internet). There is also a chapter covering books on the Internet. Directory of Directories on the Internet gives you a lot less detail about FTP, for example, and less of an idea of the exact operating system commands you may need to learn.

Okay, so maybe you still will have to contend with scraps and scribbles although it's amazing how few commands you really have to learn in order to successfully use FTP, for example, and using a program like Gopher (which can access FTP sites) could make your work even easier.

.

A really nice feature of Directory of Directories on the Internet is the inclusion of information such as:

- An idea of an item's revision status (when/how often/ever)
- Copyright restrictions
- Who might find this resource useful
- Whether you need to be using a particular operating system (e.g. UNIX)
- A sample entry. If something from the sample catches your eye, it's likely you'd find more good stuff from that source.

This book really is an excellent place to start. For example, if you are feeling information overloaded and you just want to know where it is on the Internet that you can find the directory containing all past Internet Hunt Questions and Answers, its in here. The book is indexed by: Resource Type; Internet Address; Author, Maintainer, or Supplier; and Subject.

[Previous Article](#)



[Next Article](#)

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

CLIP TIP

Anonymous FTP

FTP (File Transfer Protocol) can be initiated from your PC or from a host. There is a special User-ID for FTP users who don't have a regular User-ID on the host to or from which they wish to transfer files. This User-ID is not available on all hosts. If a host supports this special User-ID, the host is said to support Anonymous FTP. You can FTP from one Internet site to another. On the UNT campus, FTP is supported by the VAX, Sol, Jove, and CMS. You can also use FTP from yoksur PC or Mac in certain situations (contact ACS at 565-2324 if you have questions about this).

To FTP to an anonymous FTP site, you would type: ftp remoteIP Address. The IP address will look something like: FTP.unt.edu or 129.120.1.1 (this is the Anonymous FTP account on Sol). When prompted for a username you would type: anonymous. When prompted for a password you would type your User-ID (me@unt.edu for example). You can now use the dir command to see a directory listing, cd command to change directories, and the get filename command to transfer files (remember to type binary before transferring binary files). You can type help if you have questions about FTP commands.

[Previous Article](#)



[Next Article](#)

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

Some Welcome Changes Come to the Local Dial-up Lines

We have installed some new terminal server equipment that will greatly increase the reliability and functionality of the 3989 local dialup line. All communication settings are the same for the 565-3989 line (8-N-1), no matter which system you connect to. The 565-3300 line still requires you to set your communication program to 7-S-1 when connecting to CMS (VM3270).

Now, when you call 565-3989 you will be greeted with a menu instead of the old # prompt. From the menu, select the desired host system. If the host system isn't in the menu, simply type: **telnet host.system.name.here** to connect to the system of your choice (substituting the correct node information for that system, of course).

The inside front page of this issue of *Benchmarks* has the phone numbers and terminal settings to use for all the fully supported UNT Dial-up lines.

[Previous Article](#)



[Next Article](#)

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

News From the CWIS/Gopher Hole

By Mark Thacker, CWIS Coordinator (thacker@unt.edu) This column covers features and resources available through the University's Gopher Campus Wide Information System (CWIS). Gopher is available on various UNT host computers including the VAX, Sol, and Jove. It is also available in the General Access Labs and on various Novell file servers around campus.



Gopher Clients

When people mention Gopher they normally think of the particular Gopher client they are used to. For most people, this is either PC Gopher or UNIX/VAX Gopher. There are, however, several more Gopher clients that are in use here at UNT. For the most part, the Gopher clients are very similar, but there are some differences that you need to be aware of and this article is designed to help you decide which Gopher client to use.

Each client is highlighted below and includes a brief table describing the hardware and software needed to run the system.

PC Gopher III

Hardware

- XT or greater
- mono or color video
- Ethernet card
- 640K RAM

Software

- Packet drivers or ODI with ODIPKT

Special Features

- Runs on low-end machines with monochrome monitors
- Same interface as Trumpet News reader for DOS - Windows-like
- Supports mouse operations
- Can call Telnet/TN3270 with automated connect scripts
- Supports Gopher+ alternate views
- Multiple simultaneous download/transaction capability
- hone book program with point-and-click field selection

Problems or Bugs

- Can not auto-launch viewers for images,, sounds,, etc.
- Does not use EMS or XMS memory - runs out of conventional memory very soon causing crashing and errors
- Has limited Gopher+ electronic form length
- Default values for electronic form is different from all other clients

- Doesn't run under Windows well at all
- Unsupported from the University of Minnesota now
- Slow network response and tricky setup
- No real on-line help despite the label for suc
- No direct connection to other Gopher server option - must navigate menus to get to anything.
- Can not print file while within PC Gopher must do so with other program

When first considering this article, I thought about calling it The Death of PC Gopher III . However, better judgement prevailed. The problems with PC Gopher and the move of our campus off DOS-only and into Windows and OS/2 for Intel based machines makes me believe that it is time to wean people from using PC Gopher. If you can use HGopher, the Gopher client for Windows, please, please, PLEASE do. Or switch over to using TurboGopher for the Macintosh!

HGopher for Windows

Hardware

- 80386SX or greater (requirements of the Trumpet TCP/IP stack)
- Ethernet card
- Windows requirements for RAM and monitor (color)

Software

- Trumpet TCP/IP stack
- Packet drivers or ODI with ODIPKT

Special Features

- Gopher+ complete support of Alternate Views,, electronic forms etc.
- Excellent display of electronic forms of any length
- Support for hundreds of definitions of viewers for files
- Winsock compliant for compatibility with other Windows Internet tools
- On-screen icons for all actions
- Multiple bookmark files
- Direct connect to remote sites using the Bookmarks capability
- Autolaunches viewers after file download
- Multiple simultaneous download/transaction capability
- Quick response and query speed
- Ability to set preferences as to which view to retrieve when multiple views of an item are available
- Automatic filename creation and download to a directory capability
- Deletes temporary files at program close
- Extensive on-line help with examples and icons
- Change display font of menus

Problems or Bugs

- Creation of bookmarks to open other Gopher connections is a bit confusing
- All transactions and new menus displayed in one window only
- Phone book lookup requires user to type query

HGopher is probably one of the best Gopher clients there is. If at all possible for you to use either this or TurboGopher for the Macintosh, please do. The Trumpet TCP/IP stack is a site license product for UNT and allows all sorts of Internet tools to work in Windows simultaneously.

TurboGopher for the Macintosh

Hardware

- Macintosh Plus or greater
- Ethernet card , SCSI adapter or built-in Ethernet

Software

- MacTCP

Special Features

- Gopher+ complete support of Alternate Views,, electronic forms etc.
- Excellent display of electronic forms of any length
- MacTCP compliant for compatibility with other Macintosh Internet tools
- Multiple bookmark files
- Direct connect to remote sites
- Launches viewers after file download with single click
- Multiple simultaneous download/transaction capability
- Quick response and query speed
- Balloon Help
- Japanese language character display with special system software
- Multiple window or single window display of menus
- Excellent phone book lookup procedure with point-and-click fields and logical separators (contains, begins with and equals)
- Can print or save items

Problems or Bugs

- limited set of viewer definitions
- Alternate views must be chosen via a menu item, not an icon

TurboGopher is probably the second best Gopher client around, but is still the fastest and most relieable Gopher client for the Macintosh. A PowerMacintosh version of it should be out soon.

UNIX/VAX Gopher

Hardware

- Modem if communicating over UNT dial-up lines
- Ethernet card if communicating on-campus

Software

- Any terminal program that emulates a VT-100 terminal
- Telnet if communicating on-campus
- Packet Drivers or ODI with ODIPKT if using Telnet

Special Features

- Unlimited viewer definition
- Runs on any machine capable of using Telnet or a modem
- Alternate views and electronic forms support



Autolaunches viewers when file is downloaded

- Direct connect to remote Gopher sites
- Good phone book query support with simple fill-in-the-field approach
- Gripe capability to send mail back to an item's maintaine
- Can download. mail., print or save files
- Can be accessed from anywhere on the Internet or from your house
- On-line help
- On-screen context sensitive display of options

Problems or Bugs

- One bookmark file supported only
- All transactions within one window (limited ot VT-100 screen)
- No multiple-transactions occurring simultaneously

The Gopher client for UNIX and VAX is actually a pretty good client. It is the only one really available if you want access to Gopher from your home. There is an anonymous Gopher login that you can use if you do not have an account on any host machine, yet still want to access it remotely.

CMS Gopher

Hardware

- Modem if communicating over UNT dial-up lines
- Ethernet card if communicating on-campus

Software

- Any program that emulates a VT-100
- Telnet or TN3270 if communicating on-campus
- Packet Drivers or ODI with ODIPKT if using Telnet or TN3270

Special Features

- Accessible from any machine capable of using Telnet/TN3270 or a modem
- Direct connect to remote Gopher sites
- Good phone book query support with simple fill-in-the-field approach
- Can print or save files
- Can be accessed from anywhere on the Internet or from your house

Problems or Bugs

- One bookmark file supported only
- All transactions within one window (limited to VT-100/3270 screen)
- No multiple-transactions occurring simultaneously
- Not Gopher+ capable - no electronic forms or alternate views

The CMS Gopher client is not all that much different from the UNIX/VAX Gopher client and should only really be used if you have access to CMS only. Remember to type TCPIP before typing GOPHER when running it. It is not, to my knowledge, Gopher+ compatible, which limits its usefulness somewhat because there is no support for electronic forms and the like.

I hope that this has helped to clear up any questions you had about which Gopher client to use. If you want to learn more about Gopher or about using the clients menioned above, drop by ISB 119 and talk to me, register for a short course on using Gopher, or send me E-mail.



[Previous Article](#)



[Next Article](#)

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

IRC Program Groups

Minutes provided by Sue Harrison, Recording Secretary May 17, 1994

Voting Members: Ray von Dran, Library and Information Sciences (Chair); Cengiz Capan, College of Business; Carolyn Cunningham, Student Affairs; Paul Dworak, College of Music; Brian Forsman, UNTHSC Information Resources Council; Chuck Fuller, Fiscal Affairs; Larry Gleeson, School of Visual Arts; Don Grose, Libraries; David Hartman, School of Community Services and School of Merchandising and Hospitality Management; Monica Holmes, Graduate Student Council; Sam Magill, UNTHSC Director of Information Technology Services; Steve Miller, Administrative Affairs; Tom Newell, Telecommunications (Ex-officio); Don Palermo, Academic Administration; Jean Schaaake, College of Arts and Sciences; Paul Schlieve, College of Education; John Todd, Faculty Senate; Virginia Wheelless, Associate Vice President and Director, University Planning and Institutional Research; Steve Williams, Undergraduate Student Association. IRC Ex-officio Nonvoting Members: Bill Buntain, Computing Center; Jim Curry, Microcomputer Maintenance Shop; Paul Gandel, Computing Center; Richard Harris, Computing Center; Coy Hoggard, Computing Center.

Richard Harris distributed a diagram which showed how the IRC Program Groups interact with Providers and Users in the Planning Process, as well as a current list of Program Group Members, and the initial charges as they were given to the groups. Harris explained that at the last Strategic Planning Committee meeting the primary activity was to answer the question: What do the Program Groups do now? The Goals, Objectives, and Strategies have been submitted to the UPC, and all of the major University-wide strategies will be carried forward into the University plan. This does not mean that all of the strategies will be funded, however; they will fall back to the budgetary process to be funded. The program groups will continue to be very active in assisting with planning, funding, monitoring, and evaluating projects to implement information technology strategies.

Distance Learning

Ray von Dran reported that the Provost has asked that the issue of distance learning be addressed by the IRC. There is also a Dean's committee looking into this, but they will be concerned mostly with their own departmental long-range plans and how distance learning will fit into those plans. Von Dran plans to bring representatives from the Computing Center, the Library, Telecommunications and the Instructional Technology Committee together with the Dean's committee to work on this issue, after which von Dran will work with Jack Davis, taking into consideration the input from all of these groups. In addition, some time in the summer there will be a campus-wide forum to discuss distance learning. He stressed the importance of moving quickly on this and on working to clarify the definition of distance learning. Von Dran explained that after all input has been gathered, the IRC will need to come forward with a recommendation based on a proposal from the Deans.

Lab Fee Increase Requested

Cengiz Capan distributed a letter he wrote to David Kesterson regarding a request for a fee increase. Capan reported that statistics from the Check-in system reports show an overall increase in lab usage of 1 to 2% every year, even though student enrollment is declining at the rate of 3% per year. Philip Baczewski added that the statistics show that usage has spread out more evenly over all the labs. Paul Dworak commented that the labs have only been in existence a few years and to change them now would not be a good idea. Capan continued that it will discourage students from using the labs if current technology is not available in them. GAL has given money back to the colleges to update equipment as they needed to rather than wait and do a general upgrade of all the labs at one time.

Capan stressed that if General Access Labs are going to be operated right, to serve students' needs and the University's needs, it is necessary to have these additional funds.

The Chair asked the Council if it wants to support the initial request GAL made last year for a fee increase of \$.75/credit hour (\$.25 of which was put into effect last year). Discussion continued during which it was pointed out that whereas the Adaptive Lab used to be supported by the Provost's contingency funds, it is now a line item in the GAL budget. In addition, most of the current lab equipment was purchased from Prop II funds and it will definitely need to be upgraded in order to provide the services needed. If there is no fee increase, GAL will have to request Prop II funds for equipment upgrades.

Capan brought to the floor the GAL Committee's recommendation to resubmit the original recommendation to increase the lab fee the remaining \$.50 for the upcoming academic year, and it was approved unanimously.

GUI Migration

Bill Buntain made a presentation for the Standards & Cooperation Program Group on the migration to Graphical User Interfaces. The Program Group proposes the following, to occur in FY96, to address computer hardware issues:

1. that a fixed amount of money be budgeted on a periodic basis;
2. that allocations be based on Faculty/Qualified Staff Distribution (Staff defined as Administrative, Professional, Technical, and Clerical);
3. that the migration apply to a choice of platforms;
4. that suballocations be made at the Vice President/Dean level;
5. that the migration be administered through the Microcomputer Maintenance Shop;
6. and that progress be reported through the Standards & Cooperation Program Group to the IRC.

Buntain explained that the issue of excluded personnel, as well as what kind of machine should be included are two issues that the Program Group has not come to agreement on. At the present time, they believe that notebook computers should not be included.

Other Business

Buntain continued with an action plan for campus-wide acquisition of software to begin in September of 1994. The Standards & Cooperation Program Group proposes that an allocation of \$250,000 be made per year for the licensing of products from WordPerfect, Microsoft, Lotus and Borland with funds being placed in a separate account administered by the Computing Center.

Ray von Dran suggested that he take these proposals before the Deans; that they be considered at the next Strategic Planning Committee meeting, and then be brought back to the IRC at its June meeting. It was agreed that the proposals be dealt with as two separate proposals, since one is proposed for FY95 and the other for FY96.

Philip Baczewski distributed two documents, one dealing with a movement towards an enterprise-wide User-ID system, for information purposes. The second document dealt with issues relating to the upgrade or replacement of the Academic Mainframe. It was recommended that this subject be given to the Instruction and Research Program Groups asking that those groups provide input to Philip so that he can make a presentation to the IRC at its June meeting.

June 14, 1994 Program Group Reports

The Chair called for reports from each of the IRC Program Groups, specifically related to their activity and suggested changes they might wish to make in the groups at this time.

For the Administrative Program Group, Joneel Harris reported that Philip Baczewski had spoken to the group about proposals for Academic Computing, since one of them impacts the administrative mainframe. The group also discussed the remote access policy. She announced that on July 8, 1994, from 2:00-4:00, in Union 411, IBM will present upgrade options for the existing IBM ES9000 mainframe computer, as well as various client/server options.

For the Standards and Cooperation Program Group, Susan Pierce reported that they are continuing to meet on the 2nd and 4th Mondays of every month. The group has been dealing with security at the last two meetings.

For the Instruction Program Group, Paul Gandel reported that the group had met with the Instructional Technology Committee to look at an Academic mainframe upgrade, at which a number of questions were raised. The ITC took the assignment to conduct a needs assessment, and the groups plan to meet again in July with an eye towards making a recommendation to the IRC in September.

Centralized Purchasing of Software

Susan Pierce presented the recommendation of the Standards & Cooperation Program Group for centralized purchasing of software site licenses so that individual departments can stop ordering it by the package. The proposal would require \$250,000 per year in centralized funding.

In the discussion that followed, questions were raised regarding funding, and administration of the centralized purchasing arrangement. It was pointed out that one advantage would be better tracking of software, which would reduce the problem of unlicensed software. It was explained that the funding issues will have to be dealt with by the Vice Presidents, and that the IRC is only being asked to recommend the concept. Several other advantages of such a plan were pointed out; for example: the cost of single copies of software are extremely low for departments when purchased through the proposed licensing program; also, with low cost software upgrades available to everyone, departments can keep up-to-date copies of software running, making software support much more manageable, since only the latest versions of software would need to be supported.

The proposal, as brought to the IRC by Susan Pierce, Convener of the Standards & Cooperation Program Group, with the addition of a friendly amendment made by John Windsor, is as follows: The IRC proposes the allocation of monies for centralized purchasing and licensing of software products for University computing, for example, WordPerfect, Microsoft, Lotus and Borland software. The proposal, as amended, was unanimously approved.

Virginia Wheelless suggested that the responsibility for coordination and implementation of the plan be given to the Computing Center. Richard Harris accepted the responsibility, and the Chair said that if the concept is approved by the Vice Presidents, he would take it to Richard to work out the details.

User-IDs and E-Mail

Philip Baczewski reported that he is continuing to revise the specifications document for the Enterprise-wide User I.D. system based on input from various persons. The next step will be to develop an action plan.

Paul Schlieve, as Chair of the E-Mail Task Force, reported having met individually with several people to finalize a recommendation that he and Bill Buntain will be presenting to the E-Mail Task Force. Paul stressed that the E-Mail Task Force will not mandate what software gets run or how it

gets supported. Departments will determine what happens at the departmental level and the Computing Center will determine what gets done at the back end. He hopes to bring the final recommendation to the IRC soon.

Computer Security Issues

Susan Pierce distributed a document concerning Computer Security Issues, which details a new Texas Administrative Code on Information Security Standards for all state agencies. Complete implementation of this code is mandatory by the end of 1997. She reported that UNT has a head start because the IRC has already prepared a security policy. Susan discussed the new law with the Standards & Cooperation Program Group and from their discussion came the following issues which must be addressed:

1. UNT policies should be reviewed and revised to parallel the state standards. It is recommended that the IRC charge the Standards & Cooperation Program Group to draft a revision of the policy for review by the IRC;
2. An Information Security Function must be established to administer the IRSP. It is recommended that the IRC affirm the appointment of Susan Pierce, Computing Center;
3. Security Awareness Training must be implemented for all users. Unless the work is distributed between departments (such as Computing Center, Personnel, network managers, and others), this will require significant new staff resources. It is recommended that the IRC charge the Computing Center with the development of a curriculum and a project plan for training. Once approved by the IRC, the IRC Chair will present the plan to the Information Resources Steering Committee and seek commitment for necessary support, including staff support;
4. Non-disclosure agreements should be signed by all users, with a special non-disclosure agreement to be signed by each system administrator. It is recommended that the IRC charge the Standards & Cooperation Group with the development of (1) non-disclosure agreements for users and for system administrators, and (2) a plan to implement this process.
5. A login banner ' should appear at the time (ideally BEFORE) a user logs in to any UNT multiuser computer system, which reads:

In accordance with state security standards: Unauthorized use is prohibited. Usage may be subject to security testing and monitoring. Abuse is subject to criminal prosecution.

It is recommended that the IRC endorse a login banner as a standard for all UNT multiuser computer systems;

6. The law states that 'Management reviews of physical security measures shall be conducted annually...' It is recommended that Internal Audit be responsible for conducting these reviews;
7. A periodic, comprehensive risk analysis of all information processing systems is required. It is recommended that the Computing Center investigate the possibility of initially outsourcing this task.

The Chair said that the Strategic Planning Committee will look at all of these issues and bring them before the IRC at the July meeting.

General Access Lab Access Problems

Paul Gandel reported that there have been a fair amount of complaints from persons who have been denied access to General Access Labs. In the discussion that followed, it was pointed out that Ph.D and Master's Degree students and students working on Incompletes are approved to use General Access Labs through the summer months. It was noted that a large part of the problem is students not enrolled in the summer but who plan to attend in the fall. Eriq Neale stated that the General Access Labs try to accommodate these students. Eriq distributed a document concerning these issues which explained the current policies of the General Access Labs. Virginia Wheelless recommended that the

General Access Lab Committee be asked to follow the Recreational Sports model for summer participation by nonenrolled students, which is to require a small fee for use of programs and facilities. The motion was seconded and passed unanimously.

[Previous Article](#)



[Table of Contents](#)

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu



Happy Birthday Macintosh

By Mark Thacker, CWIS Coordinator
thacker@unt.edu

In this ever evolving world of technology, it's refreshing to look back on significant milestones to get a perspective of where we are and where we might be going. Today, I bring you a living example of a milestone - the Macintosh personal computer. January 1994 marks the Macintosh's 10th birthday, and its time to celebrate one of the unique developments in the computer industry.

So, I now give you a brief synopsis of the history of the Macintosh. It is both amusing and sobering. The most interesting part however, is that the next ten years promise to be just as the last.

The Early/Teething Years

In late 1983, people began seeing odd commercials on TV, commercials which promised a new kind of computer. One that promised (borrowing from the Orwell novel) 1984 won't be like *Nineteen Eighty-Four*." This computer was the [Apple](#) Macintosh. It was the first popular consumer market computer featuring a graphical user interface (GUI). Until then, there had been a few prototype systems, including the [Xerox PARC](#) Star and Apple's own Lisa. The Lisa was touted as a "rethinking of what a computer should be." However, it was very expensive for the time (the figure of \$10,000 comes to mind) and was very underpowered. The Lisa later resurfaced as the Mac XL for a brief time (it emulated a weak Mac 512K) then was quietly buried in a virtual silicon grave. So what about the Macintosh thing?

The Mac brought a new attitude toward using a computer, writing programs, and thinking about computing in general. The entire interface and use were based upon the use of a mouse with a single button. To enforce the use of a mouse, the first Mac keyboard did not have a function, arrow, or scrolling keys. Gosh, they were serious about this whole point-and-click think!

The original Mac was also a very compact design, integrating the monitor, disk drive and CPU together into one compact case. The only external cables were the power, keyboard and mouse cables. The monitor was a 9" monochrome that featured an easy-to-read, black-on-white format for documents. The slow decay amber/green monitors commonly used on other machines looked a bit anemic compared to the crisp Macintosh monitor. Truly, as this was a computer like no other at the time. However, you can still see the original Mac's design evident in today's Macintosh ColorClassic II and the Performa series, [Compaq's](#) Presario, and [IBM's](#) [PS/1](#) computers.

The first Mac also introduced the idea of putting most of the operating system into ROM so that programmers could spend time and space writing their program, not writing the interface to their program. Programmers also had to rethink the way they wrote software for personal computers. Everything was event driven and the program responded to what the user did, not what particular prompt was on the screen. This method of programming is now considered the standard way of producing applications on microcomputers.

Sales of the Mac were slow at first because of two reasons:

- lack of software, and
- lack of software.

The price wasn't much of a factor as one might think. A new 128K Mac cost \$2,495, not bad when compared with the \$4,995 price tag of an [IBM PC-XT](#) or the \$5,469 of an [IBM PC AT](#) introduced one year later. The Mac had only a single, nonstandard (then) 3.5" disk drive onto which you had to run either your operating system or an application. Because programs took longer to write for the Mac than they did for character based machines (the IBM PC), software pickings were slim. Apple introduced Mac 512K to solve the problem of not enough memory in the original Mac, but that didn't really help. In fact, Apple had a one-year supply of the Mac 512K by 1986 and had sold their entire supply of 3.5" disks back to Sony because of lack of interest.

However, companies like [Lotus](#), [Microsoft](#) and Software Applications eventually brought out software for the Mac. With a whopping 400K of disk storage on the single drive, it was a wonder that programs like [Microsoft Word](#) or Excel could run at all. However, programmers hacked on the code, lived with the fact that the first Macs couldn't boot from the hard drive, even if you did hook it to the modem port as required. Programmers also had to write programs for the [Motorola](#) 68000 microprocessor differently than for the 8088 and 8086 in the IBM-PC systems.

As software support rose and people realized that this unusually designed machine could be usefil as more than just a toy, the Mac community began to grow. The introduction of the Macintosh Plus addressed many problems of the earlier Macs. It included *one* whole megabyte of RAM. What an ocean of memory! It also finally introduced the Small Computer Systems Interface (SCSI) for connecting the hard drive. This interface is also considered a standard for microcomputers now

One other development was so basic that I almost forgot it. The Mac introduced the first consumer based What-You-See-Is-What-You-Get (WYSIWYG) interface for printing. Now, when you saw a 10 point *italic* Times Roman character on your screen, you could be assured that the printed version would be the same size and be on the same place on paper as it was on screen. Mac, [Windows](#) and [OS/2](#) users take this for granted now, but it's hard to remember that the average computer did not have WYSIWYG capabilities in 1984, and some still don't! Looking back on these early Macs, it is interesting that the Apple could be on both the leading and trailing edge of technology at the same time!

The Mac Grows Up

In 1987, Apple released the Mac SE and II to establish a new line of performance and minimum requirements for future Macintosh computers. The Mac II in particular was the first to use the 68020, open slots for future expansion and a choice of monitors. It was an absolute powerhouse for the Mac line. IBM-PC makers however were talking about and using the brand new Intel 80386 chip, which was more powerful in terms of processing power. The Mac began playing a game of cat and mouse with Intel based machines.

The expansion capabilities for the Mac came with quite a few goodies. The SE contained and expansion slot that surfaced later as "processor direct slots" (PDS) in other Macs. Note that Intel based machines are just now appearing with something called "local bus," which effectively is like the PDS on Macs. The NuBus expansion capability is carried on to this day, where you plug an expansion board into your machine without having to configure a single DIP switch, jumper, or worry about memory addresses. IBM does that with Microchannel, which shipped two to three years after NuBus appeared on the Mac II.

Color was also introduced with the Mac II. The Mac was capable of 256 colors out of a palette of



16.8 million. This was much better than most machine of its time. As people began to use the Mac for photo work, the demand for greater capability in color display grew. Apple finally decided on a standard way of doing 32-bit color and began encoding it for the Macintosh ROMs shortly after that. Most modern Macs can display thousands or millions of colors by simply adding more video memory to the built-in display card.

More importantly than just revolutions in the capability of the CPU, the Apple [LaserWriter](#) was introduced in 1985. For the first time, the words "[PostScript](#) laser printer" and "scalable typeface" became part of the standard vocabulary of Macintosh users. Many people realized that they could now produce their own newsletters and not have to worry about jagged fonts or multiple point sizes of fonts installed in their computer. [Adobe](#) Systems owes much of their success to the success of the Apple LaserWriter and the shift in perception of what was possible for publishing with a desktop computer.

With the LaserWriter came one other item, AppleTalk networking. Macintosh users could use simple phone cable connectors (called PhoneNet) to wire their own network between Macs and LaserWriters. With the recent deregulation of the phone company, it became legal for consumers to wire their own house and phone based networks. So, Apple now had computers that were truly network aware right out of the box.

Sound capabilities were also included and expanded on slowly during this time. The Mac II featured the Apple Stereo Sound Chip. At 8 bit, 22KHz resolution, it wasn't exactly CD quality, but a heck of a lot better than the simple "beep" that was typical of other machines. It was long before people began sampling all sorts of sounds to play on the Mac. Even back in 1987, you would often hear Macintosh computers in campus labs laughing, screaming or quoting a line from your favorite movie.

The Modern Mac

One of the most important recent developments in the Macintosh was the introduction of [System 7](#), which shipped in 1991. This operating system finally made the Mac a true workstation-like computer and allowed Apple to take advantage of modular system extensions. Let's say that you wanted to add a new way of operating your computer, perhaps speaker-independent voice recognition. Don't rewrite the whole operating system, simply include an extension that makes new capabilities available to almost all existing applications. It also allows you to distribute the modifications to only those users who need it.

System 7 also included several other technologies that are just now beginning to make their rounds to other computer systems. Cooperative multitasking was not really new to the Mac, but was much refined, allowing a user to run multiple programs at once and cut & paste and even send certain messages among them. TrueType font technology allowed variable WYSIWYG fonts on non-PostScript printers (side note: Apple also licensed this technology to Microsoft for the use of Windows and Macintosh machines). Built-in file sharing means that an organization interested primarily in sharing files or E-mail need not purchase a file server. The system can share files with other Macintoshes very easily.

Apple has also adopted a flexible design philosophy that allows them to manufacture similar motherboards and cases that are upgradeable for future use. Previously, all Macs up to the IIfx has essentially been designed from scratch every time. The modular nature of the operating system also allows Apple to modify designs and just ship a new extension to make the hardware usable. In fact, in 1993, Apple shipped out seven different machines all based upon the 68040 CPU alone! This doesn't even include the other models of Macintosh.

Systems are also faster now. The standard processor in the Macintosh line is quickly becoming the



68040, a chip comparable to Intel's 486 series. The original Mac ran a 68000 CPU at 8 MHz; the fastest production Mac now runs a 68040 at 40 MHz. With all of this extra speed comes extra capabilities such as color processing, digital video, and better sound capabilities. The built-in networking capability of the Mac is now high-speed Ethernet rather than slower LocalTalk.

Speaking of new capabilities, the Mac that I am writing this on, a Macintosh [Quadra 660AV](#), has the following built-in: speaker-independent (no training) voice recognition, digital audio (16 bit, 44.8 KHz - better than CD quality) input and output, S-video and regular NTSC video input and output (dump your presentation directly to video tape on the Mac), Ethernet networking, Cd-ROM with playthrough to speakers without any CPU time used, high density 1.44MB disk drive, file sharing, 32,000 color display capability, 8 MB of RAM (expandable to 68 MB), 230MB hard drive, an AT&T 32-bit Digital Signal Processor, capability to act as a telephone/answering machine/fax modem, and 25MHz 68040 processor. (For additional information on this computer, see the article on page 6 of this issue of *Benchmarks*.)

Compatibility with DOS based machines is also quite common through file translation software and through DOS emulators. This article was written using WordPerfect for Macintosh which can save files in WordPerfect 5.1 DOS format, for example. For those wanting to run DOS software on their Mac, you can either purchase a coprocessor board that fits into your Mac and acts as a DOS machine, or you can run emulation software (SoftPC from Insignia Solutions) that allows your Mac to run DOS/MS-Windows software in a window on your Macintosh. (For additional information, see the article on [page 10 of this issue of Benchmarks](#).)

The New Genesis of the Mac

Where is the Mac headed? In 1991 Apple asked this question and came up with a unique answer: PowerPC. Apple signed a deal with IBM and Motorola to manufacture and market a new CPU designed from the IBM RS/6000 chips to be known as PowerPC. This new chip is totally different from the modern Motorola 680x0 chip; it uses a different instruction set or language; it is RISC based; it runs at a different motherboard; and the Macintosh operating system must be translated to work on it.

Essentially, Apple and IBM have agreed that their future lies with the PowerPC processor. It has the advantage that it is a brand new chip that is more powerful than Intel's Pentium (whose technology is really at the end of its lifetime). There are already two additional models of the PowerPC chip planned (the first is the 601, followed by the 604, and the 610). A variety of major vendors support the chip, including Apple, IBM, Sun, Cray Supercomputers, WordPerfect, Microsoft and others.

Beginning sometime in April, Apple will ship its first PowerPC-based Macintoshes. Eventually, PowerPC will allow you to run Macintosh, UNIX, [OS/2](#), [MS-DOS](#) and [MS-Windows NT](#) all on the same machine (in some cases, at the same time in multiple windows). Apple will ship a version of System 7 for use with the PowerPC that will allow modern programmers to run unchanged on the new systems. The PowerPC runs so quickly it will actually emulate a Motorola 680LC40 in software!

The future of the Mac is bright indeed. There is so much information about the PowerPC that it could fill a book. In fact, you can call Motorola at 1-800-845-MOTO for more general information about the PowerPC. Apple has announced upgrade paths for some existing Macintosh users and promises third-party upgrades for others. Call Apple at 1-800-732-3131, ext. 150 for additional PowerPC Macintosh information.

For now, it is safe to say that the Apple Macintosh has had a very interesting 10-year history and that it promises to be just as interesting over the next 10 years. When the original Mac was introduced, no one really thought that we would be directing our computers to do things with voice command (and

that they would talk back to us), playing CDs in the background and making movies, not in 10 at least. Who knows what we will do in the next 10 years as we move to even faster processors and the Macintosh picks up more capabilities. Hack, you will probably be listening to this article being read to you by some hand-held wireless system while you compose (using voice or pen and maybe a keyboard) your commentery on the 20th birthday of the Mac. Please be kind when commenting on how shortsighted thoses of us in the 90's were!

[Table of Contents](#)



[Next Article](#)

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

Confessions of a Former Mac Hater

How the AV Converted Me From a Casual User to an Addict

By Eriq Neale, ACS General Access Lab Manager (neale@unt.edu)

I can sum up my opinion of the new Macintosh AV technologies in one word: cool. This is not your average, everyday 'cool' though. It's one of those long drawn-out, very empathetic and emotional utterances of the word. A more appropriate spelling might be 'Coooooooooooooooooolllllll.....' And it would be followed by a meaningful smile. Cool. Yes indeedy.

Now that I've shared this professional, high-tech opinion with you, let me tell you how I arrived at it. I've been working with the AV technologies on my desk for about two months now. There was an incredibly high 'Wow-factor' upon opening the box, and I admit that I basically showed off for the next several days. I was amazed at all the stuff the machine could do, and I hope that my impromptu audience was equally impressed. If not, they did an excellent job of acting. Soon, though, the newness wore off and I was back to business as usual. Except that, in some cases, work life became a little more interesting.

The AV Product Line

The AV-based Macintosh models are two of the latest model rollouts from Apple. Named the Quadra 660AV and the Quadra 840AV, these computers are designed on the same technologies as the other Quadra units. Both run on the Motorola 68040 CPU (25MHz and 40 MHz, respectively), both sport the built-in FPU, both have built-in Ethernet and video, and both come with high-density floppy disk drives and can have optional CD-ROM drives installed. In just about every respect, these units are equivalent to other Quadra units, with the 840AV having the fastest CPU of any Macintosh ever.

What separates these Macintoshes from any other Mac ever made is the addition of an [AT&T DSP](#) chip and a new video and graphics architecture. The video subsystem allows for input and output of SVHS or composite video (NTSC, SECAM, and PAL formats for the techies). The DSP (digital signal processor) allows the AVs to process 16-bit, CD-quality audio both in and out of the computer. The DSP also can be used for telephony and data communications, emulating a 14.4k baud error-correcting modem in software. The understated crowning achievement of the hardware is that it now can interpret real-time speaker-independent voice commands through the DSP and some very elaborate software.

The one item that makes these machines very attractive, however, is the small price difference between the AV equipped Macintosh and a "regular" Macintosh. For example, a Quadra 660AV is roughly a couple hundred dollars less than a similarly equipped 650. And the Quadra 840AV is only a few hundred dollars more than a similarly quipped Quadra 800. So where Apple could easily have inflated the price on these units without difficult, they chose to keep the cost competitive with the remaining product line, and the goal being to get this technology into the hands of those who might not have had it before. Like myself, for instance.

The Practicality of AV Technologies

As I mentioned earlier, the first few days I had my AV I spent mostly exploring the new capabilities of the machine. But as I got back into my working routine, it didn't appear the features would be all that useful. Voice recognition is nice, but is it really effective or useful enough for daily use? How

often am I going to be digitizing digital audio? Since I don't have a CR or TV with cable in my office, how can I watch TV in the background, and am I going to be digitizing audio that frequently? My immediate answer to all these questions was negative. I didn't know at the time how the new functionality could work into my daily routine. I came to learn that dealing with this technology had a completely different kind of learning curve

Admittedly, I'm writing this article from the experienced side of the coin now, and I've learned quite a bit about how the technology can be used. In fact, as I sit here typing away, I have a CD playing in the background from the internal CD-ROM drive. This is something that could be done before, but not in 16-bit stereo at 44.1kHz, which is CD sampling frequency. Anyway, I've found that in at least two cases with this computer, more is better. I refer to both internal memory and hard disk space in this statement. As I see it, to really take the advantage of more than one aspect of the AV technologies simultaneously, a minimum of 16MB of RAM is necessary. All the features can be used with less, but they'll be used at one time. Disk space is also a valuable commodity when digitizing audio or video, as files are created when doing this will generally be in the tens to hundreds of megabytes in sizes. A 230MB drive is minimum, 500MB is better and a 1GB or more is even better. An ideal configuration would be to have a 500MB internal drive and a 1GB or larger external drive. But, of course, not that many of us can go down to Joe's Computer Store and walk out with a high-capacity drive when the mood strikes.

Before continuing with my description of the different aspects of the AV technology suite, let me say that the AV is not for everyone. Every new Mac shipping today will play back stereo audio and digital video in the form of [QuickTime](#) movies. This functionality is present in the system hardware (audio) and software (video). If your interests lie in viewing multimedia applications or taking existing multimedia pieces and putting them together into a production, then you don't need the extra hardware on AVs. I'd suggest, in fact, that you take the savings on purchasing a lesser machine and put it into disk space or extra memory. But, if you want to generate multimedia as the elemental level by digitizing your own audio clips or capturing video or animations to disk, then the AV is an indispensable tool for you.

AV Audio

We'll begin our look into AV technologies with the enhanced audio capabilities. Since the introduction of the MacII, all Macintosh computers have been able to play 8-bit stereo audio with 8, 11, and 22kHz. You had to attach a set of headphone or external speakers to hear the stereo, but it was there. Several companies developed third-party solutions for capturing audio in stereo to the Mac, and in a few cases these add-ons could digitize at frequencies higher than 22kHz, but very few claimed to give full CD-quality 44.1kHz sampling.

The addition of the AT&T DSP to the AV Macs allows the computer to digitize and play back 16-bit audio clips in stereo from 8kHz to 48kHz, a higher sampling rate than CD. Headphones or external speakers are still needed to hear the stereo playback in full, but the Audio Visual monitor can be connected to the AV Mac to play stereo audio back through its built-in Bose speakers (and let me tell you, the audio quality of those little speakers is incredible!) Digitizing stereo audio is as simple as plugging a stereo input into the microphone jack on the back of the Mac and pressing the record button. Under System 7 ([System 7.1](#) comes shipped on the AV Macs), samples can be saved into system sound files, playable on any System 7 Macintosh, although some audio quality will be lost playing back a sound file on a non-AV Mac.

High-quality audio sampling is expensive in terms of disk space. At the highest-quality input setting, 16-bit stereo at 48kHz, 4 bytes are written to disk 48,000 times per second. That translates to about 190KB/second. For a three minute sound file, that equates to about 33MB on disk. Even though some audio enthusiasts insist that you can hear a difference in quality between a 48kHz sample and a 44.1kHz sample, many others will say the difference is indistinguishable. Even dropping down to

44.1kHz sampling, the same three minute audio file drops in size to around 30MB. A 22kHz sampling drops to 15MB. Dropping the recording quality to mono or 8-bit would halve each of these predicted sizes. The point here though is that we're a long way away from being able to copy our favorite CD onto 1.4MB floppy disk to play back on another computer.

AV Video

Capturing and digitizing video has become a popular activity, either for getting information for a multimedia presentation, or just for sharing clips from your favorite TV shows with friends (the latter activity violates copyright laws and is generally frowned upon). Video capturing boards such as the Video Spigot and Video Vision, from SuperMac and Radius respectively, have allowed Mac video junkies to digitize video into QuickTime movies for a couple of years. These add-on cards tend to be rather expensive, though, and have generally been available only to true enthusiasts or the truly wealthy. Some of these solutions were combined with video accelerators so any video captured using them was replayable only on similar systems. Performance quality vanished completely if a movie was played back on a "regular" system.

The video subsystem on the AV Macs handily tackles this issue and another important one, displaying Mac video on an external monitor, like a TV. There are four video ports on the back of the AV Macintosh: an RCA composite video in, an RCA video composite out, an SVHS in, and an SVHS out. The AV Macs have an app called the FusionRecorder installed on the disk. This app, part of the VideoFusion QuickTime editing suite, allows you to capture video from the composite or SVHS input jack to a QuickTime movie. You can capture video at 160x120 pixels, 320x240 pixels, or at 640x480 (full screen resolution). Other video capturing applications may allow you to capture video at different resolutions, such as Passport Producer Pro that can capture at any custom resolution.

The "better is more" caveat applies here also. Each frame of a 160x120 video clip digitized in 8-bit color, minus audio, occupies 18.75K of space uncompressed. At 15 frames per second, each second of video occupies 281.25K of disk space. The larger resolutions and larger bit-depth captures get increasingly larger. To take the same image in 24-bit color format, each frame will occupy 56.25K of disk uncompressed, while a second of video, captured at 15 frames per second, will occupy 843.75K of disk space. So, to capture full-screen images at full-motion speeds (30 frames per second) in 8-bit color, you need 8.79MB of disk space for each second of video, or 300K per frame. Needless to say, without some form of image compression, full-screen full-motion digitizing is not yet possible even on the Quadra 840AV.

QuickTime does have several compression algorithms available for digitizing and playing back video clips. In fact, QuickTime does not work with raw video. Every video clip digitized for QuickTime is compressed, even minimally. The compression algorithms offer a variety of compression ratios, but each has a price to pay. Generally, the higher the compression ratio, the poorer the video quality. Apple's highest-compression algorithm, called "Cinepark," compressed a two-minute video clip I digitized in 16-bit color from over 200MB to under 8MB of disk space. The quality on the final clip was usable and, given the relative newness of video clips in local presentations, still had a high "wow factor." The tradeoff? It took over 90 minutes to compress the clip. Of the four clips I digitized for the presentation, most were compressed right after I left work, during my lunch break, or while I was off at meetings. It's possible to do other work on your Mac while compressing in the background, but neither process benefits from doing so.

One does not have to digitize video to take advantage of the video technologies in AV, however. The AV Macs ship with Video Monitor, an app that displays a video signal from either the composite or SVHS input on the monitor at QuickTime window sizes (160x120, 320x240, or 640x480). This is handy for viewing video promotions, training videos, or "The Simpsons" (the latter being done off the clock or behind closed doors, also not recommended). Video Monitor can also "grab" a frame of

video to the clipboard for inclusion in another program. This is highly useful for taking "video snapshots" of people or other objects for a variety of uses. You can simply connect a camcorder to the video while running Video Monitor and grab whatever the camera sees to the clipboard.

Video conferencing is not only popular in business and education these days, but also relatively easy to do with the AVs. A video conferencing program called ESoF2F ships on the AV that, when connected to a camcorder or other camera input, allows point-to-point video conferencing between Macs connected via Ethernet. This program only transmits video, not audio, and Ethernet is recommended because of the vast amount of video data being pumped across the network. We have tested this minimally across an Ethernet connection and saw fairly good throughput. I'd rather not think about what might happen across a basic AppleTalk connection. This demo application is upgradable to the full version that also handles video "whiteboarding," passing the Macintosh screen data as well as the video across the wire. How is audio handled in the full version? Same as the demo: pick up the phone.

And last, but not least, on our video tour, is the ability to direct the screen display to a TV monitor instead of a Macintosh or other compatible monitor. For years many third party solutions have been available that redirect the video output to a TV signal for display on TV monitor, or even to capture to videotape. This can now be done internally by telling the Monitors Control Panel to send the output to an external video source and connecting either a video camera or VCR to the composite output of the Mac. This is useful for taping the screen activity for use in another type of production (such as a training video) or for demonstrating use in a training classroom where an LCD overhead display may not be available. The downside to this method is that the upper and lower portions of the screen are lost due to television's overscanning the video signal for display. Essentially, you lose the screen space of the upper and lower portions of the display. This can be somewhat annoying, especially when trying to display some use of the menu. In this arena, the third party video conversion solutions have an edge over the built in video. The use of an external monitor from the Mac disables the computer monitor, whereas other products display both images simultaneously. But, if your use will be mainly for presentations using slide shows (such as from a <http://www.microsoft.com/mspowerpoint/default.htm>>PowerPoint or Persuasion), the internal video output is more than sufficient.

AV Telephony

Another aspect of the DSP chip on the AV that I've been using frequently is the telephony capabilities. Through software, the DSP chip can emulate a 14.4kbps error-correcting fax modem. The GeoPort connects the DSP to the outside world through a variety of means, including standard telephone, ISDN, and others. Currently, only the telephone adapter is available, but others will arrive in the near future. The telecom adaptor connects a standard RJ11 phone line to your Mac, enabling the use of the fax modem. The GeoPort extensions make the telecom adaptor look like an Apple Express Modem. I use ZTerm to connect to our local 14.4 error-correcting dialups, AppleLink to get information from Apple directly, and America Online for entertainment. I've sent and received faxes on campus and across the country. I've even used AppleTalk Remote Access to dial into my Mac from a [PowerBook](#) out of town to read mail and copy files back and forth. All without purchasing a modem.

Another app that ships with AV is ApplePhone. When used with a GeoPort and a microphone, ApplePhone turns your Macintosh into a speaker phone. This may seem quite toyish at first, but is useful for those of use who get cramps holding the phone with out shoulders while continuing to type at our keyboards. ApplePhone also has a built-in answering machine that will answer the phone after four rings, play an outgoing message, and digitize an incoming message for later retrieval. This application is basic in its functionality, but really shows the potential of the telephony applications to come. It's now possible to create a program that would allow your Mac to operate like one of those common (and oh, so annoying) voice mail systems that would direct call ("To speak with someone in

sales, please press '1)'), take a message for a particular person ("Hi, this is Bob..."), and play back recorded messages over the phone line ("Press '3' to hear your messages"). There are now also headset devices that combine a microphone and earphone in a single unit for use with AV Macs. It's a dream device for shoulder cramp sufferers everywhere.

AV Voice Recognition

As I mentioned earlier, the voice recognition of the AV didn't really strike me as very practical when I first experimented with it. Sure, I could get it to select menu options from any application I had open. Sure, I could get it to select standard dialog box buttons. Sure, I could get it to shut off my Mac when I was done for the day (like I really ever turn it off, anyway). But except for a few bells and whistles, it didn't seem to be all that useful. That's when I discovered speech macros.

The Speech Macro Editor shipped with the AV is one of the workhorses behind the smoke and mirrors of speech technology. The speech macro library that comes with the AV will have your computer tell you what time it is, what day it is, and will even greet you pleasantly. This discovery led to a large number of speech response macros. For example, the computer's response to "Computer, location of Commander [Riker](#)" is "Commander Riker is not on board the Enterprise." Similarly, "Computer, when is Eriq's birthday?" results in "Eriq's birthday is January 4th." The wonderful part of this is that your AV could quickly become your dummy partner in a stand-up routine. Hopefully, the computer will have more important uses than that.

Still, though, this was all bells and whistles. These weren't really anything substantially useful that voice recognition could do. So, for a couple of months, "Computer" didn't listen to me (I turned it off). Then, when poking around in the Speech Macro Editor (while researching this article), I discovered that the speech macros were actually scripts, and they could be based on AppleScript or QuickKeys scripts. This discovery led to two solid days of playing around with QuickKeys Test Drive (which comes shipped on the AV) and the QuickKeys scripting. After several failed attempts, I came up with some QuickKeys scripts that were actually useful. My personal favorite, and one I still use frequently, is a voice command that sets the color depth on my monitor. Some programs don't like to run in a video setting higher than 256 colors, so I have a voice macro that set the monitor to 256 colors and then runs the application. It sure beats opening the Control Panels folder, setting the video to 256 colors, closing the Monitors windows and the Control Panels folder, finding the application on disk, and running it.

I soon discovered the Script Editor application that comes on the AV which builds AppleScript or QuickKeys scripts and can save them as "executable" icons on the Mac. The script is nice because it will check syntax on all scripts before running them, and because it can save the scripts as stand-alone icons. It's then possible to create a script that can be run under a speech macro or just by double-clicking the icon without speech even running. Through the Script Editor I was able to begin looking into AppleScript a little deeper and created a number of scripts for use both with and without speech. The nice thing is there's only one script, and I reference it in the speech macro. I finally even found a way to get the speech macro to open my AOCE mailbox. (I won't tell you how that was done. If you want to know, you'll have to ask.) The end result is that I'm now leaving voice recognition turned on most of the time and am making use of it in my day-to-day operations, thanks mainly to the scripting extensions. And I use it to help me remember important birthdays and anniversaries. ("Computer, when is Anna's birthday?")

AV Roundup

I guess the final question comes to this. Could I live my life without an AV Macintosh? The answer is a definite 'yes.' I'm not any more productive doing what I normally do daily, although voice recognition has shaved some processing time off repetitive tasks. With the AV technologies,



however, I have a completely different world of opportunity at my fingertips. Training applications and tests or quizzes can be easily created with audio and video components. Fax and data communication are simplified and quicker on the computer. And voice recognition is not only really cool and mostly useful, but it has the most growth potential for the entire computer industry of any new technology. All in all, the AV technologies are very impressive and affordable, and I hope industry realizes the capabilities and future opportunities they offer. And you, my friend, should go out there and test drive one.

[Previous Article](#)



[Next Article](#)

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

Everybody's Doing It - Mac in a DOS World

By Sean McMains, Microcomputer Consultant (mcmains@unt.edu)

You want a new computer. You've decided that the [Macintosh](#) is the machine on which you work the best, so you tell your boss that; what you want. You explain the graphic user interface is very polished and that it helps minimize the learning curve for new applications, allowing you to spend less time digging in manuals and more at work. You tell him about the built-in multimedia features. Everything is going along smoothly until the boss asks the dreaded question: "Is it [DOS](#) compatible?" You hem and haw for a few moments, look down at your shoes, and finally look him in the eye and say "Why, yes. Yes it is."

When the Macintosh was first introduced, it was perceived as a toy computer. Not only did it have little pictures and cute graphics that were out of place on "serious" computers, but it didn't work with anything else on the market. As the PC Compatible market boomed and the Mac line became more capable and powerful, this rift was widened by Apple's continued determination to keep their system software in-house and unable to be reproduced by anyone. As a result, no one was able to develop clones of the Macintosh in the same way that had been done for the IBM machines, and the gulf between the two platforms remained unbridged.

Macintosh and DOS Compatibility

This is what we in the computer industry like to call a "third party opportunity." Seeing that there might be quite a demand for machines that could handle DOS software as well as Macintosh software, several companies developed products that would allow one to do just that. The two biggest players in this arena up until recently have been [Orange Micro](#) and [Insignia](#) solutions.

These two companies have developed different approaches to running DOS software on a Macintosh. Orange Micro's solution uses a coprocessor, while Insignia uses something called a "software emulation." Each of these technologies has its advantages and disadvantages, and might be used for different applications.

Basically what Orange Micro has done is to have designed a board that is essentially a PC-compatible computer on a card that sits inside the Mac and runs the DOS software while the Mac's CPU continues to take care of Mac software. The advantage to this arrangement is that it essentially provides the user with two complete computers in one box, allowing one to run different kinds of programs simultaneously and without one environment affecting the performance of the other. When performance is of primary importance, this makes for an excellent solution.

Insignia has taken a very different route with their [product](#). They have basically written a program to pretend that it's a DOS machine, and to fool the DOS software into believing it as well. The advantage of this approach is that Insignia's software can tell DOS programs anything it wants about the machine configuration, and as long as it provides the necessary illusion, everything will work fine. The practical result of this is that one can use the Macintosh's mouse, serial ports, networking capabilities, etc., and all seem to the DOS program to be exactly what it would expect. This approach is also much cheaper than the coprocessor approach, as there's no extra hardware to pay for.

The Apple Solution

Recently, Apple has made this market a bit more interesting by introducing a product of their own, the [Quadra 610](#) DOS compatible. This is a Macintosh Quadra with a built-in coprocessor to allow it to run both DOS and Macintosh software. It is somewhat less capable than Orange Micro's solution,

but for the \$500 over what a Quadra would normally cost, it's hard to argue with the price.

One of the most exciting developments in this area that will occur soon is the introduction of the [PowerPC based Macintosh](#). Up to now, all Macintoshes run on the 68000 series of microcomputers. In April, Apple will begin migrating the Macintosh line over to a new kind of processor, called the PowerPC, which promises to provide performance increases of 200%-400% over the current chips. In addition, work is well underway that will allow these machines to run many different operating systems, including DOS, Macintosh, [Windows NT](#), UNIX, and others, resulting in one box that will run just about any software that's out there. The PowerPC Macintoshes will use software emulation to do their magic, but since their chips are so much faster than the existing ones, they should be able to provide performance comparable to the older processors when running code written specifically for them. Of course, code written specifically for the PowerPC will race past that which has to run in emulation mode.

Though historically the worlds of DOS and Mac have been entirely separate, the major vendors have finally begun to acknowledge that most environments are not solely Macintosh or solely PCs, but a combination of the two. This has opened the door to an unprecedented degree of interoperability between the two platforms, and has finally allowed us to have our Mac and PC as well.

[Previous Article](#)



[Next Article](#)

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

Newton Envy

By Sean McMains, Microcomputer Consultant (mcmains@unt.edu)

[Apple's Newton MessagePad](#) has been one of the most hyped, most expected, most raved about, most maligned, most publicized, most criticized piece of personal electronics to hit the market in a long time. You've probably seen the commercials, which are long on flash and short on substance, and may have even seen [Saturday Night Live's](#) parody of the Newton in the form of their "McIntosh Post-It Notes" commercial (Versatile. Intelligent. Sticky.) Even Gary Trudeau has gotten into the act, with a lengthy series of Doonesbury comics poking fun at its abilities.

So what is this little device? What does it do? And why the furor surrounding it?

"What is it?" That's a harder question than one might expect to answer, as the Newton has defined a new class of product: a "Personal Digital Assistant," or PDA for short. (The other product that falls squarely in this category is the [Tandy Zoomer](#).) PDAs are not as capable as a full-featured laptop in some respects, but they outshine the general purpose machines in other areas. PDAs are optimized to help an individual to keep track of the myriad little pieces of information that she gathers, including names and addresses, appointments, notes, sketches, to do lists, etc. They generally cost right around \$700 - significantly more than a Wizard-style product, but much less than a full-featured laptop computer, such as the [ThinkPad](#), PowerBook, or EO (a pen-based computer from [AT&T](#)).

So why the extra \$400 again over the top of the line Wizard organizers? PDAs are a far more general-purpose kind of device than are the lower-cost organizers. The Newton can not only keep track of the previously mentioned information, but can also send and receive electronic mail over the Internet, can send faxes, can reformat any of your notes and print them on 8.5X11 paper using any [PostScript Laser Printer](#), can receive alphanumeric messages over a pager network, and can exchange information easily with other Newtons using an infrared link that only requires you to point the units at each other. Additionally, the Newton can store more software in RAM, so that you can add functionality to the machine in the same way that you would a computer - just load up a new program.

In addition to all the built-in functionality, there are all kinds of software packages currently under development for the device. Fodor has already released a Newton-based guide to various cities in the United States, so that while traveling, one could ask the Newton if there were any five-star Chinese food restaurants within walking distance of one's hotel, and it would respond with a phone number so you can make reservations and directions from your hotel. There's a program that provides a map of the [Washington DC subway system](#), along with all of the stations' names and which lines stop there. Medical students have developed software to allow them to access information quickly and easily about the interactions of various drugs. Terminal emulation software is close to release as well, which will allow the Newton to dial into [Compuserve](#), local bulletin board systems, or even [UNT's](#) host systems. Finally, spreadsheet and database applications are already released or will be shortly.

Much of the commotion that has surrounded the Newton centers around some of its unique capabilities. Since the unit is too small to include a regular keyboard, Apple developed some excellent handwriting recognition software that would allow a user to write in print or cursive on the unit and have that writing converted into text that the unit can understand. Unfortunately, the moment that many individuals heard "handwriting recognition," they expected perfection, which Apple has decidedly not delivered. Newton's handwriting recognition is excellent - by far the best I've ever had the pleasure to work with - but it's not infallible. For one thing, it does require a day of training with your particular handwriting style before it will do very well. Many people also assumed that they

would be able to write just like they always do, but that is not the case. It takes a bit of time to get used to what the Newton expects to see in one's handwriting, just as it takes time to learn how to type. Learning how to use writing effectively on a Newton is certainly a much faster process than learning how to type, but it is not instantaneous as many expected it would be.

Answering the Charges

Another charge leveled at the emerging class of device is that they're just too expensive. This is true if one is thinking of them only as the equivalent of an electronic Rolodex. However, the additional communication functionality as well as the ability to load and use many other kinds of software as well provide those units with a far broader range of functionality than these less expensive devices have. Looking at them from the other direction, they don't quite do all the neat things that one can do with a good laptop machine, but they certainly cost a lot less as well. Additionally, they're actually portable enough to take with you wherever you go, a claim that cannot be honestly made by the full-featured laptop computers.

Ordering My Life

In the month since I got my Newton, it has already become indispensable to me. The electronic calendaring functions have ordered my chaotic schedule, and the alarm function has certainly gotten me promptly to appointments I might have otherwise forgotten. Having contact information for both friends and business associates at my constant beck and call has proven most valuable. In addition, my Newton is currently loaded up with several games to while away the extra time that occasionally presents itself in the lines at the supermarket ([Yahtzee](#) is a current favorite with friends), a program for tuning my guitar, various books for my enjoyment (currently [Heart of Darkness](#), [The Jungle Book](#), and [The Adventure of Black Peter](#)), a [sign language reference work](#), and a network analysis tool.

It Could Be for You

The Newton is not for everyone. However, it does provide a great means for some people of organizing all the information that is often so difficult to keep up with, as well as offering a fairly powerful computing platform that will fit in the palm of your hand.

[Previous Article](#)



[Next Article](#)

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

Purchasing a Macintosh or Other Apple Product at UNT

By Eriq Neale, ACS General Access Lab Manager (neale@unt.edu)

UNT has a purchasing contract with [Apple](#) Computer that gives University faculty, staff, and students easy avenues for purchasing Apple products, including [Macintoshes](#) and the new [Newton Message Pad](#). Faculty and staff wanting to purchase Apple Computer equipment for their offices on campus can deal with UNT Purchasing directly. Most Apple Computer equipment is on the State Price Contract, though our Higher Education Purchasing Contract gives us prices that are better than those listed on the State Contract. Current prices can be acquired from Purchasing or from Sean McMains in the Computing Center.

Apple Products for Personal Use

Students, faculty, and staff wanting to purchase an Apple product for personal use can deal with Apple Computing directly or through the University Store or [Academic Computing Services](#). Apple has instituted an 800 number for ordering products using a credit card or after having secured an Apple Computer Loan. While anyone can call and order products using this number, students, faculty, and staff are eligible for special pricing on equipment not available elsewhere. To get special pricing when placing an order, a PIN must first be generated. Apple uses this PIN to verify eligibility for the special educational pricing. Anyone can get this number through the University Store, and students can also get the number from Eriq Neale at Academic Computing Services. Eriq Neale can also provide purchase consultation for students wanting to buy a Macintosh or other products. Both locations have educational pricing information on hand.

The ordering process is simple. Once you've decided on buying an Apple product, you can get your PIN generated. Then you call 1-800-877-HIED, give them your PIN, and place your order. Based on availability, your new computer could be on your doorstep in just two weeks.

The Apple Computer Loan

If you don't have a large enough credit limit on your credit card or charge card (like me), the Apple Computer Loan could help. Students, faculty, and staff can call the Apple Loan phone number and have their application taken over the phone. If you are approved, you will get an authorization code that you can give to the Apple order line to complete the purchase transaction. Information about the loan is available from both the University Store and Academic Computing Services. The loan is limited to enrolled students and full-time faculty and staff.

Any questions regarding the purchase of Apple Computer equipment on campus may be directed to Academic Computing Services, 565-2324.

[Previous Article](#)



[Next Article](#)

If you have problems or questions about this server, please contact us as soon as possible. You can



send mail to the following address: www@unt.edu

Macintosh Emulation on Unix Workstations

Marc Thacker CWIS Coordinator (thacker@unt.edu)

As [Apple](#) Computer makes moves into the [PowerPC](#) arena, one hears more talk about the future of the Macintosh environment being available on more than one hardware platform. Of course, Apple will ship PowerPC Macintosh computers, running a version of Apple's [System 7](#) operating system soon. However, there is one other major market that Apple wants a share of: the UNIX workstation market. To this end, Apple and other companies have made moves and products to allow people with UNIX workstations to run Macintosh applications on their machines. By allowing UNIX based products to run Mac applications, Apple and other vendors hope to ensure that the Macintosh marketplace will grow - and that it wouldn't depend so much on hardware from one vendor, Mac.

This article covers three different methods of allowing Macintosh applications to run on UNIX based machines. Technically there is a fourth, Apple's own UNIX implementation called [A/UX](#). This software actually runs UNIX on top of existing Apple hardware with the regular Macintosh System 7 running as a background process within it. However, I wanted to focus on non-Apple hardware Unix-based machines. So, the real question is "How can I get the Mac version of <fill in your favorite application here> to run on my <name of some major UNIX-based workstation?>" There are two current solutions and one potential solution that are covered in this article.

Quorum Equal & Latitude

The approach taken by [Quorum](#) has been to not worry about emulation a Macintosh, the Macintosh operating system or even the [Motorola](#) 680X0 chip in the Mac; rather, their software modifies existing off-the-shelf applications to run with an [X-Window](#) user interface. Their package, Equal, is available for [SPARC](#) and [Silicon Graphics](#) machines and allows particular Macintosh applications to run in the UNIX operating system while using the host machine's user interface via an X-Window. Hence, if you are running [Motif](#) or Openlook on your UNIX system, you would get Mac Microsoft Word running with a Motif or OpenLook interface.

This program spawns most likely from their work on a companion product known as Latitude. This is a developer's tool that allows Macintosh applications to be compiled to run on UNIX systems and use the X-Window user interface. Because the program is not running under any sort of Macintosh emulation mode, there are four things that limit Equal's success:

- The interface is that of the X-Window system, not the Macintosh. Hence even dialog boxes and file navigation options will appear and function differently.
- Each application must be ported seperately. Right now only Microsoft Word and Excel are available.
- No Macintosh services such as networking, Quicktime, sound and others are available for the application. Hence, don't look for a multimedia development package to be ported to Equal anytime soon.
- Since there is no Finder, CPU or operating system emulation, programs that use direct calls to any of these may not work. Obviously programs that make calls directly to the hardware will not work at all and will probably never be ported to Equal.

Equal and Latitude will be interesting to watch, but I doubt that they will capture any of the real market that Apple is shooting for with the Mac on UNIX goals. For now, if you really need to run the Mac version of Microsoft Word and Excel, then you could consider Equal. But, with other alternatives available, you may not want to.

Andataco Liken

Liken is a program written to be a more general Macintosh emulation package. It does have its own drawbacks however. Liken emulates a System 6.0.7 system, monochrome Macintosh with sparse networking or floppy disk capability. It is available for Sun SPARC and HP RISC machines and requires at least 16 Meg of RAM (normally not a problem on UNIX machines). It does offer the advantage that the Macintosh look-and-feel is preserved within an X-Window on the UNIX host.

The program runs the Macintosh operating system (one that is basically over two years out-of-date) within an X-Window on the UNIX host. This means that the entire Mac look-and-feel is preserved because programs think they are running on a Macintosh. As a result, applications do not need recompilation to run in Liken. It is worth noting that there is no emulation of any particular Motorola CPU in Liken, just emulation of the operation system. Hence, programs making calls to specific chips on the Mac motherboard, or those violating Apple's programming rules (even some of Apple's do this) will probably not work under Liken.

So far, it doesn't sound too bad, or does it? There are several key items to consider before rushing out and purchasing Liken. Since Apple did strange things to get the once-common 800K format Liken doesn't solve this problem either, allowing support only for whatever the host UNIX machine has a floppy drive; generally this is a 1.44 Meg floppy. This means that all of the software you get from manufacturers that ships on 800K floppies will be unusable in Liken.

Also, Liken only supports text cut-and-paste and a monochrome Mac screen. So, you can have millions of colors available to you on your UNIX machine and only have a black-and-white Macintosh screen, and you will only be able to cut-and-paste test strings between your other X-Window sessions and the Liken session.

Since only the single-application mode of System 6.0.7 is supported, you can not run more than one Mac program at once, unless you fire up another copy of Liken in the background on your UNIX host (basically then emulating two or more Macintosh systems).

The "virtual Mac" can access any file system that the UNIX system can, but Appletalk support is limited to only a bare handful of applications on the Macintosh side (mainly E-mail programs at this point). So, don't count on being able to access other Appleshare/Netware file servers with Liken. Speaking of networking, there is also no support for serial ports, so your Mac applications can not access a modem or other device normally available.

Oh yeah, speed. Liken does a reasonable job of executing, but even on a fairly well equipped UNIX host, it is very likely that a mid-range Macintosh will outperform Liken. Given the amount of emulation that Liken is doing, this is still fairly respectable.

The most interesting part of Liken is that it is closest to the way that Apple wants to do emulation of the Macintosh on Unix. It is also the closest in concept to a product from [Insignia](#) called [SoftPC](#) or [SoftWindows](#), in which an MS-DOS compatible is completely emulated on a UNIX (or Macintosh) machine. Insignia went one step further than just emulating the operating system as their software emulates the actual hardware as well and has proven to be very bulletproof as a result. Andataco has promised a System 7 version of Liken, but no official word has been given concerning color or specific Motorola CPU emulation.

Apple Services for Open Systems

Vaporware. Yep, all products are as perfect as vaporware. This suite of product however, does indeed promise to do something not really done before - allow Macintosh applications to run at near native

speeds on UNIX hosts without recompilation. They also promise one other thing: an officially supported Apple method of moving to open systems standards with the Macintosh environment.

Apple has been working to allow the Finder and other off-the-shelf applications to run under IBM's [AIX](#) UNIX operating system since they announced the joint IBM-Apple-Motorola PowerPC project in October 1991. From this, it is believed, that Apple has rewritten major portions of the Macintosh operating system and Toolbox (the "look-and-feel" portion of the Mac) into a portable form allowing it to be compiled onto a variety of UNIX host machines. Since the OS and Toolbox would actually be UNIX applications, native UNIX systems to handle input/output and graphics drawing would be used when a Mac application calls for them. So, the speed of software running in this environment should be fast as well

Officially, Apple has announced that it will ship native versions of the Macintosh Toolbox and A.P.I. (Applications Programmer Interface) for IBM's AIX, Sun's Solaris, [Hewlett Packard's HP-UX](#) and Univell's [UNIXware](#) (UNIX on Intel machines from [Novell](#)). Apple has also said that they will allow major applications and certain system enhancements to run unmodified in a single X-Window on a UNIX system. Support for system extensions such as [Quicktime](#), [AOCE](#), [Quickdraw GX](#) and others will also be provided. In addition, developers will be able to write UNIX applications that take advantage of the Macintosh system extensions while still remaining UNIX applications (Quicktime movie viewers for Sun machines for instance). These last two items are what mark the difference between Apple's intentions and the other two alternatives above.

Apple's first real test of this idea is with PowerOpen, the joint UNIX operating environment from Apple and IBM. Here, Apple is integrating its own UNIX implementation, A/UX with IBM's AIX UNIX onto the PowerPC (and other) CPU. PowerOpen will offer the ability to run "personalities" of different systems, including the Macintosh. Originally, Apple said that the Mac personality would include a Motorola 68040 emulator, and emulated versions of the Macintosh Toolbox and ROMs. This was to be accomplished using a binary translator package known as FlashPort, which translates a Macintosh program directly to a UNIX executable program. Since the initial announcement, Apple has since backed away from this method and has gone with the more reliable alternative of actually recompiling the Toolbox and Finder to run as UNIX applications.

So, when can we see something? Remember that word "vaporware"? Apple originally said they would have something for the Sun SPARCstation machines by the end of 1993. Well, I haven't seen anything, have you? Rumor has it that first quarter 1994 is the new deadline for having something available. Isn't it curious that this would happen to coincide with the introduction of the PowerPC Macintoshes? I would not be too surprised to see the PowerOpen portion of the project on schedule with something released by then as well. PowerOpen promises to do a variety of things as well, including running multiple "personalities" on multiple hardware platforms.

Does a Solution Exist?

If you need to run a variety of Macintosh applications today on your UNIX workstation and you don't mind putting up with some limitations, Liken is probably your best choice. If you have a Mac on your desk and you just need to run UNIX, this article was not the one that you should have been reading! There are at least two good solutions to that problem as well (for later articles of course!) The wise buyer will adopt a wait-and-see attitude for this particular subject. Apple is making major noise about wanting to be an open company. An official Apple solution to the problem of the Mac on UNIX will come, but who really knows what form it will take?

References

- "Mac apps to find a new home on UNIX turd," [Macweek](#), May 17, 1993

- "Mac apps find home on UNIX," *Macweek*, January 1, 1993
- "Mac also rises on Sun Workstations," *Macweek*, January 1, 1993

[Previous Article](#)



[Next Article](#)

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu

Internet Tools for Macintosh

[Dr. Philip Baczewski](#), Assistant Director of Academic Computing Services (ac12@unt.edu)

Any computer attached to the campus Ethernet network has access to the Internet; however, the Macintosh has some particularly friendly tools available for Internet access. The Macintosh, because of the nature of its graphical interface, can provide some unique views and methods of accessing Internet resources

The article provides an overview of the tools that are available to perform various network tasks. This article also assumes some knowledge of Internet services. Most of these programs are available on a no or low cost basis, and a source for each program is generally provided with each description. If you require assistance in acquiring any of these programs or would like more information, contact Sean McMains (mcmains@unt.edu; 565-2039), Eriq Neale (neale@unt.edu; 565-4808), Mark Thacker (thacker@unt.edu; 565-2568), or Philip Baczewski (ac12@unt.edu; 565-3886) at the UNT Computing Center (ISB 119).

[Pegasus Mail for the Macintosh](#)- Pegasus Mail for the Macintosh can be run on systems that are connected to the campus network as well as supported by a Novell file server that provides Macintosh services (currently around 16 on campus). Pegasus mail can provide Internet mail service directly from the Macintosh. Not only will it allow you to send mail to others at Internet sites, but it will also allow you to subscribe to BITNIT and Internet mailing lists. As the campus moves to a more unified microcomputer electronic mail system, one priority is to be sure that Macintosh computers are equal players in the mail arena. If you have questions in regards to your machine's access to Pegasus mail, contact your Novell Network manager or contact Mike Murdock (murdock@cc1.unt.edu; 565-4314) at the UNT Computing Center.

[MacTCP](#)- MacTCP is an addition to your Macintosh's operating system. MacTCP supports a transparent interface between the various networking programs and the TCP/IP network (in this case, the Internet). Once MacTCP is installed, you will probably not ever use it directly, however, a number of the programs discussed below will use it as their access point to the Internet. [Academic Computing Services](#) currently maintains a site license for version 1.11 of MacTCP. If you wish it to be installed on your Macintosh, contact Sean McMains (mcmains@unt.edu; 565-2039) at the UNT Computing Center.

[Telnet](#)- The Computing Center supports [NCSA](#) Telnet version 2.5 for the Macintosh as the Internet VT100 remote login solution. No only will this program provide access to our on-campus host and card catalog systems, but it will also let you connect to remote library card catalog systems and a number of other Internet services. If your Macintosh is connected to the Campus Ethernet network, you can copy NCSA Telnet from Academic Computing Services' AppleShare server named Mimas. Use Chooser to select the AppleShare services in the ISB ACS zone and then connect to Mimas as Guest. You'll find the NCSA Telnet self-extracting archive on the "Best of Macintosh" volume in the "Mac Internet Tools/Telnet" folder. If this procedure won't work for you, contact the Computing Center for assistance.

TN3270- TN3270 is the Telnet equivalent for accessing IBM mainframes. It will allow you to establish a remote-login connection over the Internet to mainframe systems and do the appropriate terminal emulation. The version of TN3270 for the Macintosh that is available was written at Brown University. BrownTN3270 is also handy if you use the UNT's Academic mainframe system. Like Telnet, this program is available on Mimas, on "Best of Macintosh" in the "Mac Internet Tools/TN3270" folder.

[Fetch](#)- Fetch is a very nicely written program to perform ftp file transfers to and from remote sites. Fetch was written by at [Dartmouth College](#), a campus that makes extensive use of Macintosh computers, and Fetch is free of charge to educational users. Fetch offers a Macintosh-style interface for connecting to anonymous ftp sites and retrieving files. It will also automatically decode files of various compression and text encoding types. For example, if a file you fetch from a remote site is in Binhex format, Fetch will perform the file transfer and then open a window for you to specify where to save the decoded version of the file. Fetch can also do the same for

the popular public domain compression program formats. Another nice feature of Fetch is its ability to analyze a file and determine what type it is. The program lets you specify whether the file transferred will be text or binary. There is also an "Automatic" selection which causes Fetch to attempt to determine the file type, in almost all cases successfully. This ability, combined with the automatic conversion features, makes Fetch one of the easiest Internet tools to use. Fetch is available on Mimas on "Best of Macintosh" in "Mac Internet Tools/FTP/Client."

TurboGopher- TurboGopher is one of the best ways to gain access to the Gopher system that UNT is using as the basis for its campus-wide information system. TurboGopher makes use of the Macintosh's graphical interface tools, or as some put it, "Mac things," to create an intuitive interface to the resources available from Gopher services. When using TurboGopher, it is also necessary to have NCSA Telnet and Brown TN3270 installed in order to have full access to the resources available via Gopher. You can find TurboGopher on Mimas on "Best of Macintosh" in "Mac Internet Tools/Gopher/Client." For more information about Gopher, see the November/December 1993 issue of *Benchmarks* or contact Mark Thacker (thacker@unt.edu; 565-2568).

News Readers- Several USENet news readers are available for the Macintosh, and there has yet to be a standard set for supporting one here at UNT. Each of the following has some good features, but none has yet been identified as being best suited for our needs on this campus.

Nuntius: Nuntius is a news reader program that is "freeware," meaning that while it is copyrighted, there is no charge for its use. It has very nice Macintosh-style hierarchic interface, with groups of groups represented by a file icon. However, because Nuntius is written to support a mail program called [Eudora](#), no direct mail services are available when using this program here on the UNT campus. Thus means that while you can post news messages, direct replies to the original poster are not possible, and news messages cannot be forwarded to other people's mail addresses.

NewsWatcher: NewsWatcher is another freeware program for reading Network News on a Macintosh. It has one advantage over Nuntius in being able to reply to a message via E-mail. Like Nuntius, forwarding messages to other mail addresses is not possible. While it has a graphical user interface, it is not as hierarchic as that of Nuntius.

InterNews: Internews is a news reader written at Dartmouth College and is free for use at Educational institutions. In addition to its news reading capability, InterNews has some built-in mailing functionality for forwarding news messages or replying directly to a news message's author. Unfortunately, the InterNews user interface is not as "Mac-like" as the previous two programs, however, its functionality makes it a candidate for a supported package here at UNT.

If you are interested in more information about Macintosh news readers, contact Mark Thacker (thacker@unt.edu; 565-2568) at the UNT Computing Center.

MacX- MacX is a software product from [Apple Computer Inc.](#) which implements X Window server software on the Macintosh. MacX can use the Macintosh's graphical interface as its window manager. The Computing Center currently maintains a site license for MacX version 1.1 which will work with Macintoshes running System 6. For those using System 7, you will need to purchase a right to update license for \$17.00 which will entitle you to have version 1.2 installed. For more information, contact Sean McMains (mcmains@unt.edu; 565-2039) at the UNT Computing Center.

Mosaic- Mosaic is the newest entry to the suite of Internet tools. Mosaic is a free program written by the National Center for Supercomputer Applications (NCSA, also the Telnet folks). Mosaic provides access to diverse Internet resources including World Wide Web servers, Gophers servers, ftp sites, and WAIS databases. Mosaic uses a graphical interface as its navigational tool and its concept is quite suited to the Macintosh environment. Mosaic requires that MacTCP be installed on your machine. Be forewarned that the Macintosh version is still a bit buggy and tends to be a memory hog. If you are interested in trying it out, you can retrieve it via anonymous ftp (or via Fetch) from <ftp.ncsa.uiuc.edu> in the "/pub/mosaic/macintosh" directory

If you have problems or questions about this server, please contact us as soon as possible. You can send mail to the following address: www@unt.edu